NOVEMBER 4, 1996 VOLUME 13, NUMBER 45

NetworkWorld

THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING

How to build a Web site that can **TAKE A HIT**

Page 61.

Tag Switching everywhere?

Shooting for a standard, Cisco seeks help of rivals to push Tag Switching through the IETF.

By Jim Duffy
San Jose, Calif.

In an ambitious move to offset the momentum of IP switching vendor Ipsilon Networks, Inc., Cisco Systems, Inc. is attempting to line up scores of vendors to help standardize its network scaling technology.

Cisco is contacting 51 vendors to solicit support for Tag Switching, its scheme for increasing the performance of IP internets, sources said. Initially, Cisco is looking for help in driving Tag Switching through the Internet Engineering Task Force (IETF), but ultimately, Cisco hopes these vendors will implement Tag Switching in their products, sources said.

Cisco's plan is especially bold, given that some of the vendors on its Tag Switching "hit list" include staunch competitors such as IBM, Bay Networks, Inc., Cabletron Systems, Inc., 3Com Corp., FORE Systems, Inc. and Newbridge Networks, Inc. Also on the list are heavyweights Compaq Computer Corp., Intel Corp. and Microsoft Corp.

It seems Ipsilon and Cascade Communications Corp. were the only vendors that are not targeted. Cisco, which confirmed the campaign, said Ipsilon and Cascade are aware of it but have not been solicited for active participation.

"It will be an opportunity for a lot of different vendors to have a say in what is in the standard . . . and have change control," said Dave Benham, senior ATM product manager at Cisco. "That's good supply-side economics when you think about it."

Analysts were divided on whether Cisco's crusade will

See Tag Switching, *page 16*

Switching standoff? Download from Network World Fusion:

- A table comparing IP and Tag Switching features
- An IP switching primer
- A technical overview of Tag Switching

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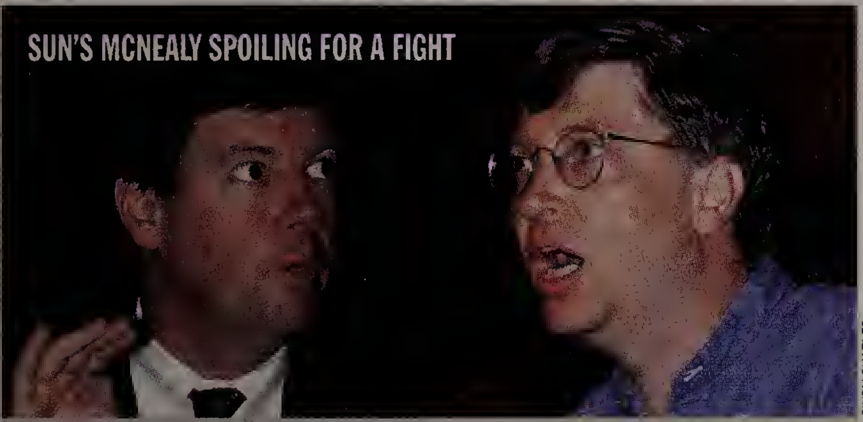
SUN'S MCNEALY SPOILING FOR A FIGHT



STEVE BORNS

CINDY CHARLES

Sun's Scott McNealy touts JavaStation as a PC killer. Microsoft's Bill Gates begs to differ. Here's how the contestants stack up.

Sun JavaStation specs:

- MicroSPARCIIep processor
- JavaOS (Java Virtual Machine and class libraries)
- 8M- to 128M-byte RAM
- No internal hard disk or floppy drive
- 10Base-T (and 100Base-T later) net interface
- **Downloads and runs Java applications and JavaOS from Sun Solaris server**

Microsoft NetPC requirements:

- Pentium processor 100-MHz or greater
- 32-bit Windows operating systems
- 16M-byte RAM, minimum
- Internal hard disk for caching
- "Minimal" user interaction to install and configure devices
- No end-user expansion slots
- **Runs Windows applications**

Customers take sides in coming 'Net device battle

By John Cox, Carol Sliwa and Ellen Messmer

Last week's announcement by Sun Microsystems, Inc. of a Java-based Network Computer (NC) and Microsoft Corp.'s quickly assembled disclosure of a Windows-oriented device divided customers into three camps — believers in Java-based NCs, Microsoft followers and those deeply skeptical of both.

The reactions reveal a fascinating twist: Many Microsoft loyalists are thinking in terms of protecting the investment in Windows operating systems and desktop applications, which are now legacy systems.

But other MIS managers clearly see the Network Computer, and its underlying Internet/Web technologies, as an important step in delivering information and applications faster to users.

And the engine that could drive Network Computers, or so-called thin clients, to success may be the millions of IBM mainframe and Unix terminal users still staring at green screens.

Last Tuesday, Sun unveiled its JavaStation, which is a compact device that automatically downloads all its software and Java applications from a Sun Solaris server.

The server runs the main part of the application and handles storage and files. Sun is one of several vendors selling or developing these low-cost desktop machines.

In an effort to steal Sun's thunder, Microsoft last Monday announced it was launching,

See Sun-Microsoft, *page 83*

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Access Network World Fusion using the number in yellow. See page 5 for details.

Sprint offers SNA over frame relay test drives

By David Rohde
Chicago

If you are an AT&T shop using private lines to support SNA traffic, expect Sprint Corp. to dangle a sizable financial incentive in front of your nose to get you to migrate that traffic to Sprint's frame relay service.

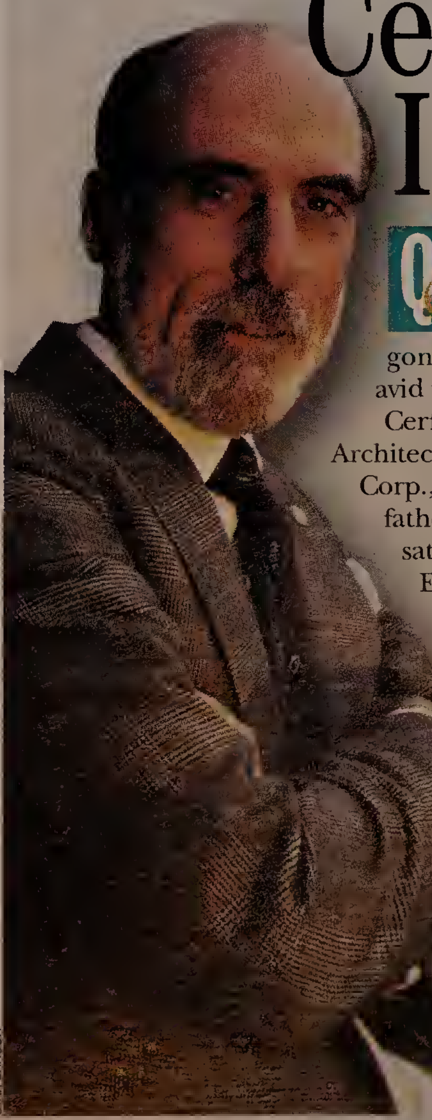
Under the carrier's soon-to-be-announced SNA Advantage Program, users will be able to trial Sprint's Burst Express Plus frame relay service for three months. They can then either continue with Sprint and receive a credit for the trial period — in effect, getting the next three months of frame relay usage free — or drop the service with no further obligation.

Trials of the SNA Advantage Program begin here this month, where Sprint has quietly mailed invitation letters to 1,000 companies. Barring unforeseen hurdles, Sprint will roll out the program nationwide on Jan. 1,

See Sprint, *page 83*

AT&T lowers frame and boosts private-line prices; FCC kills tariffs. See stories. Page 8.

Cerf'n the Internet



STAN BAROUH

Q&A

"My whole goal in life is to make the Internet go where no network has gone before," says Vinton Cerf, an avid fan of science fiction.

Cerf, senior vice president of Data Architecture at MCI Telecommunications Corp., is the man many consider the father of the Internet. In a conversation with *Network World* Enterprise Editor Charles Bruno, Cerf predicted an Internet supporting 300 million computers by the turn of the century, making it about half the size of the telephone network. He also talked about what causes instability on the 'Net, warned against security letdowns and expressed concerns about highly touted technologies like the Resource Reservation Protocol (RSVP).

See Cerf, *page 84*

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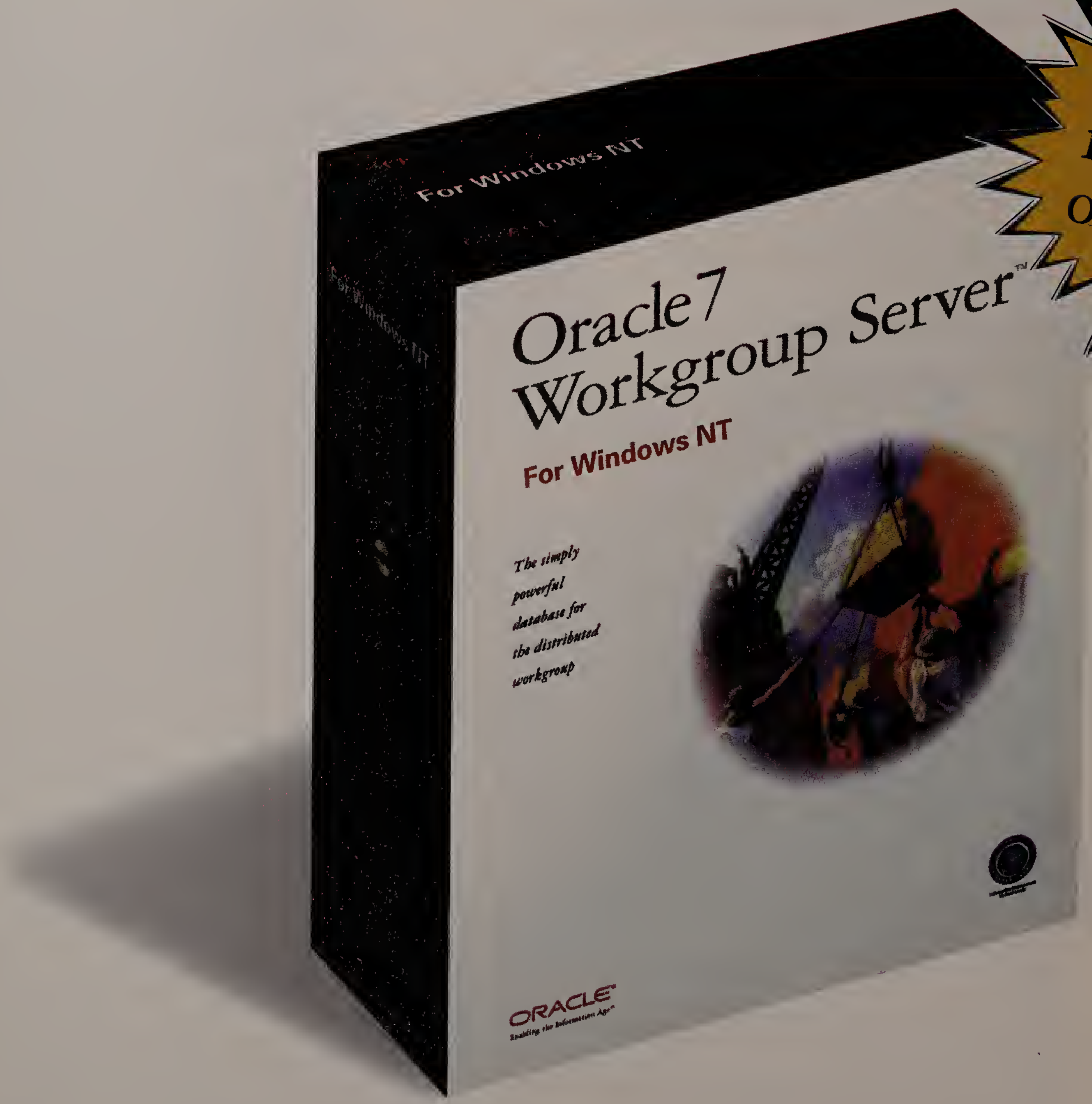
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This Week

News+

- **Switching:** Cisco and Ipsilon are in a race to line up other vendors to back their plans for increasing packet throughput across broadband nets. Check out a chart that shows how Cisco's Tag Switching compares to Ipsilon's IP switching as well as a third alternative from Toshiba. Grab papers that discuss the proposals in detail. **DocFinder: 1148.**
- **Internet:** Download the complete transcript of our interview with the ever-provocative 'Net pioneer Vinton Cerf. **DocFinder: 1149.**
- **Network PCs:** Download a copy of the Joe Object Request Broker that Sun will use to link its JavaStations with networks, as well as technical specs for the JavaStation and Microsoft's rival NetPC. **DocFinder: 1150.**
- **Java:** Get directions on how to begin building JavaBeans-based applets before Sun releases the formal JavaBeans API, and read a paper from Microsoft comparing Java with ActiveX. **DocFinder: 1145.**
- **SNA:** Download white papers and primers that explain the hows and whys of moving SNA from leased lines to frame relay. **DocFinder: 1151.**
- **Client/server and the Web:** Grab a white paper on managing the transition from client/server to intranet-based systems, and read a document on using a modified proxy server to provide Web access to existing client/server applications. **DocFinder: 1142.**
- **Desktop management:** Learn about the latest efforts to reduce the costs of managing desktop workstations across a network. **DocFinder: 1144.**

NetRef

- Read our report on building a high-capacity Web site (page 61), then come online for links to sites run by the experts we interviewed, and info about the products we mentioned. **DocFinder: 1140.**

HOW TO GET ON TO NETWORK WORLD FUSION

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NetworkWorld Fusion CONFERENCE PICK

What acronyms do you think networking needs? Read Daniel Briere and Christine Heckart's column (page 26), then upload your own suggestions. Select Forum, Columnists then Briere/Heckart.

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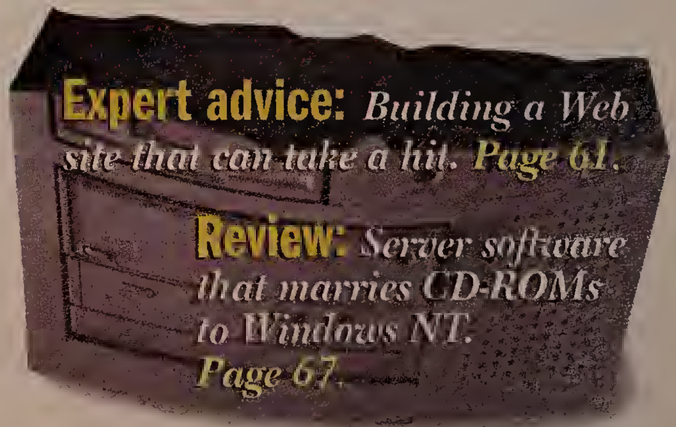

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NetworkWorld's *Mission: To provide news and analysis that help network IS professionals deliver the network computing infrastructure and distributed applications required to meet evolving business needs.*

News briefs, November 4, 1996

Microsoft wishes Netscape a scary Halloween

By the time its Site Builder Conference wrapped on Halloween eve late last week, Microsoft Corp. had fed its Web site developers and customers enough treats to send them home happy. Here is the rundown. Some of the new platform pieces that left many of the over 2,000 conference attendees impressed included: the Internet Studio Web application development tool; Visual Basic 5.0, Control Creation Edition; dynamic HTML technology (code-named Trident); and a WYSIWYG Web tool code-named Terra Cotta.

■ Internet Studio, formerly known as Blackbird, has changed so radically that it is not considered the same entity. It will let developers build — in a visual environment — Web applications that use server-side processing and can connect with corporate databases.

■ Visual Basic 5.0, Control Creation Edition, is a stripped-down version of Visual Basic 5.0 that allows developers to create ActiveX controls more easily.

■ With Dynamic HTML, or Trident, developers can write an HTML page and script it to change the underlying structure of the page on the fly without ever having to do a round-trip to the server.

■ The Web tool code-named Terra Cotta was described as a "next-generation WYSIWYG tool that brings together both page layout and programming into a common set of scenarios," centered around Trident.

Bad boys backing down?

■ Reports surfaced last week that Cisco Systems, Inc. this week will reinstate Cabletron Systems, Inc.'s Internetwork Operating System (IOS) license. Cisco yanked IOS from Cabletron due to a particularly negative advertising and marketing campaign against Cisco (*NW*, Oct. 14, page 1). Now that the campaign has ended, the companies are apparently ready to bury the hatchet. Cisco and Cabletron spokespeople said the companies are negotiating customer service and support issues, but they declined to comment when asked if Cabletron's IOS license would be reinstated.

DSPC shells out $400m for wireless LAN tech

■ PCS chipmaker DSP Communications, Inc. (DSPC) last week announced plans to acquire wireless LAN vendor Proxim, Inc. for some $400 million. DSPC hopes to use the Proxim buy to give it a leg up in the emerging indoor and outdoor wireless markets. Proxim is most known for its RangeLAN2 product. The deal is expected to be completed this January.

Cold winter ahead for telecom reform?

TELECOM IN TRANSITION

■ Supreme Court Justice Clarence Thomas last week refused a request by the Federal Communications Commission, AT&T and others to lift an appeals court stay of the FCC's local competition rules. The parties said they would now appeal to Justice John Paul Stevens. But observers said the FCC rules implementing the guts of the Telecommunications Act of 1996 are likely to remain frozen until January, when the appeals court hears the full case brought against the rules by LECs.

MCI, BT consider creating transatlantic behemoth

■ MCI Communications Corp. announced Friday afternoon that its board of directors would meet over the weekend to decide whether to merge with British Telecommunications plc. BT already holds a 20% stake in MCI, and the two jointly operate the Concert global services company.

Immediate reaction from analysts toward a prospective merger was positive, citing the possibility of unified networking platforms across the oceans. MCI and BT have already worked through the "cultural clashes" typical of international joint ventures, said Melodie Reagan, director of local and long-distance consulting at TeleChoice, Inc. in Verona, N.J. "Now they're used to working with each other," she said.

Switch vendors differ on management

By Jodi Cohen

San Jose, Calif.

When it comes to switch management, all vendors are not created equal. That was the conclusion analysts and customers came to at last week's Switched Networks & VLANs conference here, where they sized up the management features found in Bay Networks, Inc., Cabletron Systems, Inc., Cisco Systems, Inc. and 3Com Corp. LAN switching gear.

It has become increasingly difficult of late for customers to distinguish among companies' product lines as vendors broaden their product portfolios in an effort to become one-stop networking shops. But there are some key differentiators — in the areas of autoconfiguration, Remote Monitoring 2 (RMON2) and modeling support — that really set the vendors apart, showgoers said (see graphic).

"Considering switch management was almost nonexistent 12 to 15 months ago, the industry has come a long way," said John Morency, principal at The Registry, Inc., a consultancy based in Newton, Mass. "But some vendors have gone a lot further than others."

One differentiator among vendors is the ability to automatically assign endstations to one or more virtual LANs. This autoconfiguration capability is where Cabletron really stands tall, industry observers said.

"Cabletron's Vnet Manager will actually go out and learn about my network and automatically configure VLANs for me," said James Weidel, director of networking at the University of Southern California, who is using Cabletron switches. "I don't know of another vendor that will let me do that."

HOW THE BIG FOUR DIFFER ON SWITCHED MANAGEMENT

Key differentiators include RMON2, modeling and autoconfiguration support.

Mgmt. feature	Bay	Cabletron	Cisco	3Com
RMON	●	●	●	●
RMON2	●	▬	●	●
End-to-end traffic monitoring/performance mgmt.	●	●	●	●
Topology rendering	▬	▬	▬	▬
Response-time management	▬	▬	▬	▬
Modeling support	●	▬	●	●
Autoconfiguration	▬	●	▬	▬

● Yes ▬ No

SOURCE: THE REGISTRY, NEWTON, MASS.

VLAN configuration changes are more cumbersome with Bay switches, however. To change an endstation from one VLAN to another, a net manager needs to use Bay's LAN Architect software to drag and drop the user into the new subnet, as well as Bay's AutoSphere Topology software (part of Network Atlas) to check that the network change has been made.

"You need two products just to make this change," Morency said. "Clearly, Bay needs better cross-product integration. In fact, Cabletron is the only vendor to totally automate this function."

Cabletron is also ahead of the pack when it comes to policy-based management, a key component of the Vnet Manager application, analysts said.

"Companies like Cisco are evolving toward an automated, policy-based VLAN model that Cabletron already has today," Morency said. "In fact, I don't see Cisco or 3Com getting to policy-based VLANs until late 1997."

But Cabletron falls short in other important areas of switch management, such as RMON2 and response-time management tools, analysts said.

"The absence of RMON2 will hurt Cabletron somewhat," said John McConnell, president of McConnell Consulting, Inc. in Boulder, Colo. "Also, Cabletron falls short in helping net managers to better understand network throughput and response time, which is really one of the most critical management features."

Some noticeable differences among vendors can also be found when it comes to modeling support. For example, Bay and Cisco provide network modeling and design products with Optivity Design and NetSys tools, respectively. But Cabletron and 3Com lack such software as a major part of their management products, and neither company has strong partnerships with other companies that could provide such tools, analysts said.

"All of the vendors have gone in different directions, and clearly some are stronger in some areas than others right now," McConnell said. "But the real area of concern is where all

See **Start-up,** *page 8*

CORRECTIONS

In our Oct. 21 issue, we gave incorrect contact information for RAD Network Devices. RAD can be reached at (201) 512-9771 or toll-free at (888) 234-5763. Their URL is www.rndinc.com.

In that same issue, we incorrectly described Macromedia, Inc.'s Shockwave. Shockwave is designed to bring audio and multimedia to Web users.

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Bye-bye, long-distance tariffs

By David Rohde
Washington, D.C.

The Federal Communications Commission last week ordered the nation's long-distance carriers to stop filing tariffs, ending a 62-year-old system of rate regulation that had sunk into a bureaucratic morass involving millions of pieces of paper.

Under the FCC order, carriers have nine months to cancel all of their tariffs and convert user deals into ordinary commercial-law contracts. The new system will end carriers' ability to change rates on a term contract simply by altering the rates of the underlying tariff, putting contracts for carrier services on the same footing as contracts for customer premises equipment (CPE) and network software.

Courts had repeatedly ruled that changes in tariff filings override terms in private contracts, a process that several FCC commissioners labeled as "trumping the deal" and unfair to users.

Observers called the FCC decision a rare total victory for corporate network managers. They noted that groups representing large end users — such as the Ad Hoc Telecommunications Users Committee and the American Petroleum Institute — were virtually the only ones to wholeheartedly support the FCC's proposal to end tariffs (*NW*, March 25, page 1).

Most long-distance carriers, state governments, and consumer and small business groups either opposed the proposal or asked the FCC to keep some tariffs alive.

Several regional Bell operating companies said they would support killing long-distance tariffs only if they could also drop tariffs.

But FCC officials said RBOC tariffs would remain in effect for the foreseeable future.

Users could encounter some tricky issues during the nine-month transition period. The FCC ruled that during this time, the terms of so-called special deals — such as AT&T contract tariffs involving discount levels and volume committments — cannot be altered. However, the basic tariff rates off which the discounts are calculated can still continue to move (see graphic).

As a result, "there is no question that, in the next nine months, [long-distance carriers] will file lots of price increases," said Hank Levine, partner in the law firm of Levine, Blaszak, Block and Boothby, based here.

In addition, the commission did not indicate whether users whose contract tariffs expire more than nine months from now must be offered replacement contracts at equivalent or better rates.

Sprint Corp. said it will commit to offering all contract tariff users replacement contracts without raising rates.

"We won't reopen the rates," said Sprint's Washington spokeswoman Eileen Doherty, repeating the point several times.

Spokespeople for AT&T and MCI Communications Corp. said the two carriers were not yet prepared to make such a commitment, pending their lawyers' examination of the text of the FCC ruling.

User attorney Levine turned the rate change question around, saying network managers should consider using the transition to ordinary contracts to ask for a price decrease. ■

HOW IT WORKS

An example of the practical effects of the FCC's ruling:

You have a contract tariff with Major Carrier X. The contract allows you a 30% discount off Carrier X's 15-cents-a-minute rate for service in its Tariff 1. Therefore, your rate is 10.5 cents a minute.

Starting immediately:

- ▶ Carrier X may no longer change the 30% discount level or other terms of the contract tariff.
- ▶ It may still raise the 15-cents-a-minute rate in Tariff 1, increasing your rate to more than 10.5 cents a minute.

Nine months from now:

- ▶ The contract tariff and Tariff 1 disappear.
- ▶ Carrier X must present you with a new service contract with a fixed price for the remainder of the contract.
- ▶ Carrier X may not change the price of your service again until your contract expires.

Start-up

Continued from page 6

the vendors across the board are falling short."

The Big Four all lack tools that can collect response-time performance data, as well as provide a topological view of the network by application, industry observers said.

"We need better topology rendering tools because right now, logical network failures may not be visible from physical topology maps and vice versa," said 3Com user Cathy Lind, network administrator at the University of Colorado Hospital in Denver.

Cisco customer Brian Stengel, workgroup leader of network management services at the American Greetings Corp. in Cleveland, agreed.

"We're using HP OpenView and CiscoWorks, and the topological views we get of the network don't look anything like what I really have. So, the next major challenge for vendors will be to provide this type of end-to-end application performance management," Morency said. "That's really going to take it to the next level." ■

AT&T raises private-line rates, lowers frame relay charges

By David Rohde
Washington, D.C.

AT&T whipsawed the WAN transport market late last month by raising prices on all 2.4K to 45M bit/sec private lines and then reducing frame relay rates.

The move bumped up T-1 prices by 6%, while lower speed links inched up about 3% and higher speed private lines jumped up 10% (see Figure 1). Company officials cited the cost of upgrading network infrastructure to justify the Oct. 20 leased-line rate hike.

In particular, they cited the company's FASTAR II program, which involves construction of more than 50 interconnected OC-48 Synchonous Optical Network (SONET) fiber rings nationwide.

Despite the upgrade, however,company officials said they needed to simultaneously reduce frame relay prices about 7% to hold their own in a white-hot market. "We felt we were not priced competitively," said Steve Sobolevitch, AT&T's manager of data pricing. AT&T reduced both its port and permanent virtual circuit (PVC) charges (see Figure 2).

For the average user on a term contract whose rates move with the underlying tariff, the net impact of AT&T's move is likely to be a bigger outlay. Private-line usage remains several times as high as frame relay usage, according to 1996 estimates from market researcher Vertical Systems Group in Dedham, Mass. And even many frame relay users continue to run separate leased-line networks for different applications, noted Hank Levine, an attorney here who negotiates user contracts.

But many new user contracts are now exclusively for frame relay, Levine said. And AT&T's combined moves mean that the carrier is now comfortable with letting its base of private-line users migrate to frame relay — or fear losing them to frame relay competitors.

Levine said AT&T gave an "express signal" of this shift earlier this year. Around six months ago, the carrier began agreeing in negotiations for new and renewed customer contracts to allow frame relay usage to count toward overall corporate telecommunications volume, triggering higher overall discount percentages. AT&T achieved the same effect for its largest corporate users by adding frame relay to its Tariff 12 integrated service (*NW*, May 27, page 1).

Sobolevitch said the actual dollar impact on users may be less than the 3% to 10% hike for private lines or the 7% decrease for frame relay. That's because AT&T also adjusted its local access charges — which often eat up a big portion of user telecommunications budgets.

Some access charges went up and some went down, depending on the geography and access speed. ■

FIGURE 1: COUGHING UP MORE FOR YOUR LEASED LINES

Examples of AT&T's 6% price increase on T-1 lines and approximately 3% increase on fractional T-1 lines:

T-1 PRICES

City pair	Monthly price before Oct. 20	Monthly price as of Oct. 20
New York to Philadelphia	$3,543.40	$3,756.00
Minneapolis to St. Louis	$4,993.70	$5,293.32
San Francisco to Seattle	$5,781.45	$6,128.34

FRACTIONAL T-1 PRICES

Bandwidth	Monthly price before Oct. 20	Monthly price as of Oct. 20
9.6K, 56K and 64K bit/sec	$340, plus 28 cents per mile	$350, plus 29 cents per mile
128K bit/sec	$615, plus 51 cents per mile	$630, plus 52 cents per mile
256K bit/sec	$1,170, plus 96 cents per mile	$1,205, plus $1.00 per mile

Note: Cost of access to AT&T central offices and volume and term discounts not included.

SOURCES: AT&T, BASKING RIDGE, N.J.; CCMI, ROCKVILLE, MD.

FIGURE 2: INCENTIVE TO MOVE TO FRAME RELAY

Examples of AT&T's reduced charges for frame relay ports and permanent virtual circuits:

Port speed	Monthly price before Oct. 20	Monthly price as of Oct. 20
56/64K bit/sec	$275	$255
128K bit/sec	$560	$520
T-1	$2,470	$2,300
PVC committed information rate	**Monthly price before Oct. 20**	**Monthly price as of Oct. 20**
16K bit/sec	$31	$29
56/64K bit/sec	$101	$94
256K bit/sec	$461	$429

Note: Cost of local access to AT&T central offices and volume and term discounts not included.

SOURCE: AT&T, BASKING RIDGE, N.J.

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On the other hand,
you could do
Fast Ethernet.

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Well, this company can help you. Because only 3Com makes some of the hottest Fast Ethernet solutions in the industry, as well as some of the hottest Switched Ethernet solutions in the industry. Like (on one hand) the SuperStack™ II Switch 1000 switch and the EtherLink® XL PCI network interface card. And (on the other hand) the SuperStack II Hub 100 Fast Ethernet TX or T4 hub and the Fast EtherLink XL PCI network interface card. Either of which lets you scale workgroup performance based on the needs of the people in that workgroup.

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*Evaluation unit prices: EtherLink XL: $49. Fast EtherLink XL: $79. Limit two per customer location. Offer good while supplies last.

PointCast teams with Lotus

Unveils plan to integrate two companies' server software to communicate over intranets.

By Carol Sliwa
San Francisco

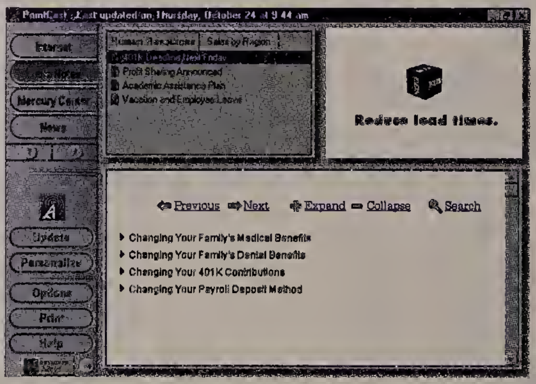
The PointCast Network caught on in a big way this year, broadcasting news and information updates to more than a million computer users' idle screens.

In the first quarter of next year, there will be a way to broadcast information managed in Lotus Development Corp.'s Notes in a similar fashion.

Lotus and PointCast, Inc. last week announced a joint venture, dubbed Lotus Domino.Broadcast for PointCast, that calls for the integration of the two companies' server software by first-quarter 1997.

Thanks to the integration of Lotus' Domino Web server and PointCast's I-Server technology, Notes administrators will be able to set up views inside Notes databases that can then be broadcast to clients.

I-Server, which PointCast began shipping on Oct. 14, allows companies to broadcast internal corporate information over their intranets. When married with the Domino technology, I-Server will gain some new capabilities.


PointCast : Last updated on Thursday, October 24 at 9:44 am
Internet
Lotus Notes
Mercury Center
News
Update
Personalize
Options
Print
Help
Human Resources
Sales by Region
401K Deadline Next Friday
Profit Sharing Announced
Academic Assistance Plan
Vacation and Employee Leave
Reduce lead times.
Previous
Next
Expand
Collapse
Search
Changing Your Family's Medical Benefits
Changing Your Family's Dental Benefits
Changing Your 401K Contributions
Changing Your Payroll Deposit Method

Lotus' Domino.Broadcast *for PointCast allows Notes administrators to set up views inside Notes databases that can then be broadcast to clients.*

For instance, a company could create a Domino application to search a competitor's Web site for pricing information. An agent could be configured to compile the data and broadcast it to sales representatives.

Notable news

In related news last week, PointCast introduced Pro-Server software that will enable companies to broadcast customizable, subscription-based news and information that will be provided through a partnership with WavePhore, Inc.

Pro-Server will be available in first-quarter 1997. Pricing has not been announced. ■

Networking standards

Vendors try new WinSock on for size

By Christine Burns
Campbell, Calif.

The WinSock API set took center stage last week as vendors gathered to announce support for the latest version of the networking specification.

The WinSock 1.1 API, deemed a standard in 1993 and now enjoying widespread support, enables communication between Windows applications over TCP/IP. WinSock 2.0 extends this functionality with support for native 32-bit environments, IP multicast, quality-of-service provisions and name resolution mechanisms.

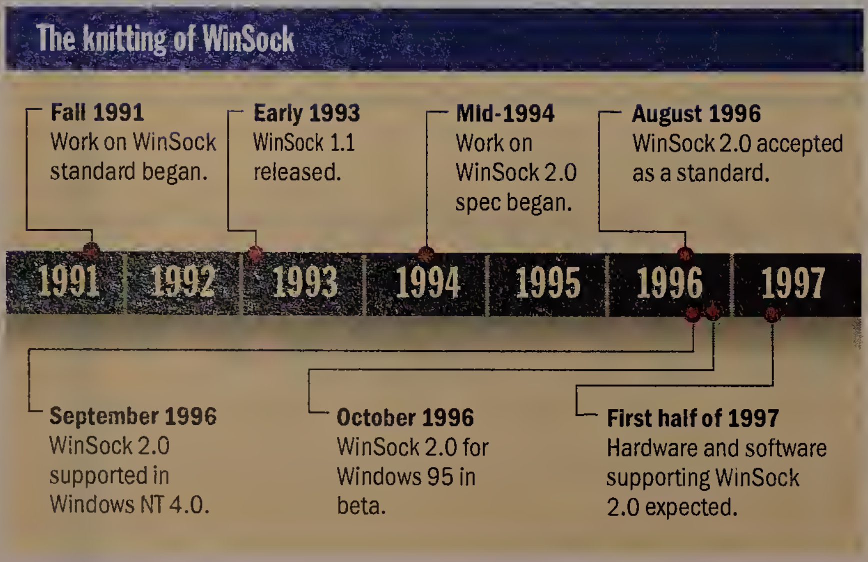
Companies such as Microsoft Corp., Novell, Inc. and Intel Corp. attended a WinSock interoperability forum and outlined how their products will support WinSock 2.0 in the future.

These products will comprise the infrastucture for new networked multimedia applications and advanced security software running over IPX/SPX, ATM and wireless networks, according to Martin Hall, chief technology officer of Stardust Technologies, Inc., sponsor of the WinSock interoperability conference here.

Microsoft released WinSock 2.0 support with Windows NT 4.0 and is currently in beta with Windows 95 platform support.

"With the WinSock 2.0 APIs included in the operating system, developers can build layered service providers that stack up under WinSock just like Legos," said Chris Steck, a Microsoft Windows program manager.

The knitting of WinSock


Fall 1991
Work on WinSock standard began.
Early 1993
WinSock 1.1 released.
Mid-1994
Work on WinSock 2.0 spec began.
August 1996
WinSock 2.0 accepted as a standard.
1991
1992
1993
1994
1995
1996
1997
September 1996
WinSock 2.0 supported in Windows NT 4.0.
October 1996
WinSock 2.0 for Windows 95 in beta.
First half of 1997
Hardware and software supporting WinSock 2.0 expected.

Topping the list

Novell tops the list of vendors putting WinSock 2.0 support in their flagship products. According to Tom Oldroyd, a product marketing manager for IntranetWare, Novell is working on a name service provider for Novell Directory Services (NDS).

Applications written to the WinSock 2.0 API will be able to access information and services stored in NDS through the name services provider. Oldroyd said Novell will deliver a software developers kit by December and expects to integrate WinSock support into IntranetWare next year.

Intel has built a service provider called PC-RSVP that allows applications to request bandwidth reservations from the network. PC-RSVP is in beta for both Windows 95 and NT.

Other companies announcing service provider support for their products were FORE Systems, Inc., FTP Software, Inc. and Cabletron Systems, Inc. ■

'NET BUZZ

The latest on the Internet/intranet industry.

Compiled by Chris Nerney

IF ONLY SMUGNESS WERE CAPITAL Many in the high-tech investment community believe Wired Ventures, Inc., which at the last minute cancelled an Oct. 25 scheduled public offering, has missed its window of opportunity for a successful IPO.

Not that Wired's latest bailout — it also pulled out of an IPO release last summer — was a bad decision. Indeed, if the publisher of *Wired* magazine and the HotWired Web site had launched the IPO on Oct. 25 as planned, it would have shared with Award Software and Infinity Financial Technology, Inc. the ignominy of being outperformed by the ticker debut of an Alabama-based pizza chain.

The poor market conditions for Internet-related companies that Wired underwriter Goldman Sachs cited in announcing the IPO postponement show no sign of improving, especially for a company many financial analysts have tagged as long on hype and short on potential long-term profitability.

Perhaps things are best left as they are. After all, the prospect of offering up pieces of Wired's cybercool kingdom to the unhip masses ("Dude, we're not gonna let, like, *old* people buy shares, are we?") is enough to drain the black from any true 'Netizen's wardrobe.

HE'S NOT TALKING ABOUT US, IS HE? Wired isn't alone. Any Internet start-up that goes public prematurely treads on dangerous turf, according to technology investment veteran R. William Burgess of Alex. Brown & Sons.

As a participant on a keynote panel during last week's Venture Market East conference, Burgess said, "A company that goes public too early, which does not have its business model defined, which does not have the appropriate management team in place . . . is going to damage a lot of value."

Bummer. Of the 65 companies presenting at the Cambridge, Mass., conference, 20 already have plans for an IPO, including 10 firms that have been around only since 1994.

VOICE OF EXPERIENCE Former Apple Computer, Inc. Chairman John Sculley thinks Silicon Graphics, Inc. may join his ex-employer on that long slide toward irrelevance.

Sculley told an audience at Venture Market East that "SGI is the next Apple in the making. They are proprietary. They are narrowly focused. They make superb products. They target a particular industry. And they're gonna get nailed" by the Intel-Microsoft partnership.

SEARCH FOR JUSTICE Digital Equipment Corp. is suing a company that is using the name of its popular search engine and linking its home page to the Digital engine.

Digital says Altavista Technology, Inc. (ATI) continues to use the AltaVista name even though DEC paid ATI in March for rights to the name.

Perhaps ATI should use AltaVista to locate a good attorney.

Got some news about a hot new Internet start-up? A "breakthrough" product about to hit the market? Inside dope on strategy and personnel moves by new and established Internet companies? Compromising photos of your competitors? Let the world know through 'Net Buzz. Contact Chris Nerney at (508) 820-7451 or cnerney@nww.com.

Managing backup and recovery
for distributed multivendor networks has been a handful.

Now it doesn't have to be.

Introducing the IBM® Network Storage Manager. You probably can't pinpoint the exact moment when the job of backing up and recovering network data got out of hand.

Maybe it was when the 1,000th user was added to your enterprise, joining 999 others who didn't see backup as a priority. Or maybe it happened when you hooked up yet another network, with another platform and another backup system.

Whenever it happened, at least you can mark today as the day the job got a lot easier to manage. Thanks to the Network Storage Manager, a new StorageSmart™ Solution from IBM.

With it, you can go from a myriad of disk systems, tape drives and software to an all-in-one solution that backs up and recovers network data automatically. So you won't have to rely on users for backup anymore. It's even preconfigured to drop into your networks, without taking them down.

Disaster plans can be automated, too, with a step-by-step process for data recovery that makes it faster and easier to get back to business.

Along with raising the security of distributed data, it also lowers the overall cost of storage management, saving on equipment and people's time. That's because there's less complexity to manage. There's also less chance of hearing "it's a software problem" from your hardware vendors and "it's a hardware problem" from your software vendors.

Network Storage Manager is an integrated hardware and software solution, featuring what experts would call a super-group of storage components. It includes a high-performance disk subsystem designed around Serial Storage Architecture for faster data transfer, and the industry-leading IBM Magstar® tape system. The brains of the group is our award-winning ADSM software that simplifies storage management. All this runs on a high-speed RISC processor.

The net-net is a solution that supports all major environments from Sun and HP to Windows® and Apple®. It also taps into your company's intranet, allowing people to use popular web browsers to recover lost files. They simply point and click, instead of calling you for help.

Another important part of this all-in-one solution is IBM service and support. Think of it as backup for your backup.

To get your hands on more storage solutions, visit us at www.storage.ibm.com/nsm or call your IBM representative.

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internetworking

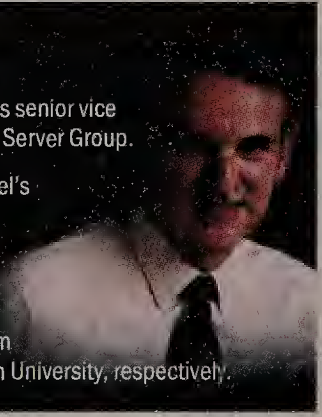
House has a Bay window

Intel executive picked to run internetworking vendor.

By Jim Duffy
Santa Clara, Calif.

Bay Networks, Inc. last week placed its hopes in the hands of an industry veteran with a proven track record when it named longtime Intel Corp. executive David House chairman, president and chief executive officer.

WHO IS DAVID HOUSE?



- He is a 22-year Intel veteran – last position held was senior vice president and general manager of Intel's Enterprise Server Group.
- From 1978 to 1991, he was general manager of Intel's Microcomputer Components Group.
- He began his career at Raytheon in 1965 designing computers and data acquisition systems.
- He has a B.S. and M.S. in Electrical Engineering from Michigan Technological University and Northeastern University, respectively.

As president and CEO, House replaces Andrew Ludwick, who resigned after three consecutive quarters of flat revenue and lackluster earnings. He also steps in as Bay's stock price registers more than 30 points below its 52-week high. Ludwick is said to have departed on his own terms, but he had also fallen out of favor with Wall Street and Bay's board of directors.

As chairman, House replaces Paul Severino, a founder of Wellfleet Communications, Inc., one-half of the two-company megamerger that formed Bay Networks in 1994. Ludwick had been CEO of SynOptics Communications Corp., the other half of the Bay equation.

Severino will stay on as a director.

Analysts reacted favorably to House's appointment.

''He's very well respected in the industry,'' said Esmeralda Silva of International Data Corp. in Framingham, Mass. ''This is exactly what Bay needed in terms of getting someone that would turn things around. His history speaks for itself.''

House's achievements during his 22 years at Intel include convincing IBM to adopt the Intel architecture for the first IBM personal computer and overseeing the highly regarded ''Intel Inside'' marketing campaign.

House will need these credentials, and maybe more, in his new post. Bay has been dogged by late product shipments, lack of leadership and superior marketing by its rivals. Indeed, Bay's lagging financials are the exception in an industry replete with high-flyers growing at remarkable rates.

The main challenges for House will be to return Bay to its former prominence through rapid product turnaround and credible marketing that instills confidence in customers, and raising the price of Bay stock about 30 points.

''He's a got a tactical problem and a strategic problem,'' said Thomas Nolle, president of CIMI Corp., a Voorhees, N.J.-based consultancy. ''The tactical problem is he's got to build sales in the near term and stop the company from taking a further credibility slide. And he's got to build the credibility of the company in a strategic sense. There's been a lot going on in the switching and ATM marketplace, and Bay's been a bit player.'' ■

Bay honcho discusses company's agenda

Q&A

Network World Senior Editor Jim Duffy caught up with new Bay Networks, Inc. honcho David House and asked a few questions about his game plan.

What's your first priority?

My first priority is to listen: to listen to the customers and the marketplace first; to listen to what their current needs are and future needs; listen to what Bay is doing well and, probably more importantly, what we don't do well. Also to listen to what our competitors do well and don't do well; listen to our employees in terms of what's working and what's not working, and what gets in the way of them doing their jobs and accomplishing the corporate objectives. After I've gone through that assessment period, then I'll decide what really needs to be done. So you won't see any changes in the near term.

As an outside observer at Intel Corp., what was your impression of Bay? What were the company's strengths and weaknesses?

This whole networking business is an exploding business, and it is in its very early stages. Although the leaders have kind of broken away from the rest of the pack, we're still in the early part of the race. I've always loved technology and product development, and I found a company that had very solid, standards-based technology here. And also a very large and loyal customer base. I don't know what all the problems are at this point in time. I can just tell you that after having talked with all the members of the board of directors, there's a consensus — at least at the board level — that there are leadership issues here, that we really need to unify this company around a single vision and a single direction. We need to do a better job of telling our overall story.

What particular challenges do you or will you face?

Well, it's a dynamic business. Clearly, it's got some strong competitors. Today, we're half the size of Cisco and about the same size as 3Com. Of course, those are fine companies, and they're doing a good job. We just need to do a better job. At this point, I can only reflect the opinion of the board of directors. Until I spend some time with the customers, marketplace and employees, I probably don't know those answers.

Keynote Systems addresses Web quality

Company's Java-based intelligent agents explain Web congestion and Internet delays.

By Ellen Messmer
San Mateo, Calif.

Ever wonder how many people tried to reach your million-dollar Web site but gave up because it was congested or Internet service was poor that day?

Start-up Keynote Systems, Inc. will answer those questions with a service called Keynote Perspective. The company sends Java-based intelligent agents out across the Internet to constantly test access to your Web site from different cities.

As a result, a corporate Web team can get real-time information on hyperlink response time, the time it takes to access URLs and Internet service problems, said Jim Barrick, Keynote's president and chief executive officer.

''Our software agents get a list of customers from our server, then get instructions on what to do from the customer's Perspective server,'' said Barrick, noting that Perspective customers themselves, not Keynote, have control over the Java agents working on their behalf.

The Perspective server can be maintained at the customer site, at Keynote's office here or even at other locations. The server collects and organizes the information retrieved by the agents, and then immediately sends it to the corporation where it can be viewed by the Web team using Perspective's desktop software.

Keynote has gotten shell accounts with 50 Internet service providers, and it is monitoring quality of service and access to corporate Web sites from about two dozen cities today, with that number expected to rise to 96 metropolitan areas — 76 in the U.S. and 20 overseas.

One beta user, Broderbund Software, Inc., found that it received 400,000 visits per day to its Web site, but once it upgraded its server capacity, the hit rate rose to 700,000.

''They had no idea that so many couldn't log on,'' Barrick said. ''The difference often means you're taking more phone calls when they can't get through on the Web.''

A future version of Perspective will run as a browser plug-in to let users control the intelligent agents through their Web browsers.

Keynote, which is still considering how to price its service, expects to charge a $10,000 sign-up fee for URL measurements next month.

©Keynote Systems: (415) 524-3011.

UUNET unveils E-commerce service

By Rebecca Sykes
Fairfax, Va.

UUNET Technologies, Inc. last week announced plans to offer an electronic commerce service as part of its existing NT Web Hosting service.

Using Microsoft Corp.'s Merchant Server software, UUNET will offer vendors shopping cart software, automatic electronic payment, optional integration with the merchant's database and secure transaction services, company officials said.

Security is provided, in part, by Merchant Server features, including VeriFone, Inc.'s vPOS software, which lets vendors transmit a customer's credit card number — in encrypted form — directly to a bank's Web site for authorization.

Security lets vendors transmit a customer's credit card number directly to a bank's Web site for authorization.

The service is designed to be a complete electronic commerce package when it is combined with UUNET's Web Hosting capabilities, according to the company officials.

UUNET Merchant Server service will be released in December. Pricing for the service is not available, but UUNET said the fee for the service will be added to fees for NT Web Hosting. Currently, dedicated hosting is priced starting at $3,000 per month, while shared hosting is priced at $500 per month.

For more information, contact UUNET at (702) 206-5600.

Sykes is a correspondent with IDG News Service's Boston bureau.

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Notes replication copied over to Web

Weblicator works with browsers to replicate Web data stored without Notes client.

By Barb Cole
Cambridge, Mass.

In a much-anticipated move, Lotus Development Corp. is making one of the best features of Notes available to users — without requiring them to run Notes clients or servers.

The company announced last week new client software that works with browsers to replicate data stored on Web servers. It also rolled out software for making its application servers more scalable and reliable.

Weblicator creates local copies of Web pages that include text, images, Java applets and links. The information is not just cached, but stored in a database so users can manipulate the pages offline. Once users select a Web site, they may employ Weblicator to download only the data from the site that has changed since they were last connected.

The software works with any Web server, but provides added bidirectional replication to applications built with the company's Domino server.

In another anticipated move, Lotus clarified its branding of servers and clients. It has dubbed the next Notes server release Lotus Domino 4.5, but will continue to market clients under the Notes brand.

In the process, the company slipped in a server price increase, doubling the cost of a standard server license to $995. The increase, effective at the start of 1997, is due to the addition of a slew of new features in Domino 4.5, company officials said.

Lotus *President Papows says, "The next stage of the revolution is all about Web servers."*

Analysts said the announcements represent Lotus' intention to turn its application server line into a set of modular components that support Internet standards.

"This turns Notes into a real Internet product because you don't need a Notes client to get access to the services of Domino," said Rob Enderle, an analyst at Giga Information Group in Santa Clara, Calif.

The Weblicator's $29 price tag is significantly less than the least expensive Notes client, which sells for $55.

Notes customers applauded the move. "We're all for it because it expands the interoperability and potential reach of Notes," said Doug Savary, staff director in the Marlborough, Mass., office of NYNEX Corp., a large Notes shop.

Nonstop Domino

While Weblicator offers stand-alone replication, Domino Advanced Services, a server option that adds clustering and partitioning capabilities to Domino, is pointed at companies looking to deploy mission-critical Web applications on Domino.

Lotus Weblicator will ship in the first quarter of 1997 on Windows 95 and NT. Domino Advanced Services will ship by year-end for $1,000 per server. A client license for its Domino server for non-Notes clients will cost $35 per seat.

©Lotus: (617) 577-8500.

Tag Switching

Continued from page 1

succeed.

"If I were an ATM switch vendor and I saw my market being the carriers and ISPs, I'd adopt it in a heartbeat," said Bobbi Murphy, principal analyst at Dataquest, Inc., based here. "What other choice do you have? Eighty percent of the routers out there are Cisco's."

"I think it's highly unlikely that Cisco's archrivals are [going] to support Tag Switching anytime soon," said David Passmore, president of Decisys, Inc. in Herndon, Va. "Cisco's obviously trying to play this up as a partner's program in the attempt to try and get the IETF to provide some rubber stamp on the standard."

3Com confirmed it was contacted by Cisco but seems unwilling to assist its rival.

"Tag Switching is positioned as a solution to a problem that they have to address," said Mick Seaman, director of systems software in 3Com's Network Systems Division. "We see this as their problem to solve. It's definitely something which is in Cisco's core market space and is limited to such."

Compaq also confirmed that it was contacted by Cisco but is holding off on endorsing Tag Switching for now, said Jeff Wilbur, director of marketing in Compaq's network products division.

FORE Systems, which also confirmed Cisco contact, said the ATM Forum's Multi-Protocol over ATM (MPOA) specification accomplishes what Tag Switching is designed to do, according to Drew Perkins, FORE's senior manager of technical marketing.

Newbridge was also approached but is still evaluating Tag Switching vis-a-vis MPOA, said Eric Andrews, Newbridge director of products marketing.

Cabletron said it had not been contacted, and Microsoft declined comment. The other vendors did not return phone calls by press time.

Cisco plans to issue a press release today that names initial backers of the Tag Switching standardization plan. These backers could include Adaptec, Inc., AG Communication Systems, Efficient Networks, Inc., Information Systems, Inc., Interphase Corp., K-Net, Ltd., Litton-Fibercom, Net2Net Corp., Network General Corp., NUKO Systems, Olicom A/S, Optical Data Systems, Inc., RADCOM, Ltd., Toshiba Corp. and Whitetree, Inc., sources said.

Cisco is also hosting a meeting between vendors, users and service providers on Nov. 6 at the Massachusetts Institute of Technology in Cambridge, Mass., to discuss Tag Switching specifications and a strategy for standardizing them. This meeting will be a precursor to an IETF meeting Dec. 9-12 here, at which time Cisco will seek to establish a Tag Switching working group in the IETF.

Introduced by Cisco in mid-September, Tag Switching is a method for scaling router backbones, which are under stress by the rapid growth of Internet and intranet traffic.

Cisco has already submitted three Tag Switching documents to the IETF.

But the company faces an uphill battle in positioning Tag Switching as an alternative to Ipsilon's IP switching.

IP switching was introduced in April. Since then, Ipsilon's protocols have been assigned request for comment numbers by the IETF; endorsed by some major switch vendors; and tested and demonstrated for multivendor interoperability between gear from major vendors, including IBM, 3Com, Cabletron and Digital Equipment Corp.

Analysts say Cisco wants to make it look as if Tag Switching is open while maintaining its market lead.

"They're going to do their implementation and then license it to other vendors," Dataquest's Murphy said. "They're going to do their Cisco-sanctioned version and make some money on it, a la IOS."

IOS is Cisco's Internetwork Operating System. ■

TAG-ALONGS?

Companies Cisco has contacted or plans to contact:

- Adaptec
- AG Communications Systems
- Alcatel
- Ascom Nexion
- ATM Limited
- Apple
- Ascend
- Bay Networks
- Cabletron
- Compaq
- Connectware
- Digital
- EduCom
- Efficient Networks
- Ericsson
- FORE
- Fujitsu
- General DataComm
- Hewlett-Packard
- Hitachi
- IBM
- Information Systems
- Intel
- Interphase
- K-Net
- Litton-Fibercom
- Madge
- Microsoft
- NEC
- Net2Net
- NetEdge
- Netmanage
- Network General
- Network Peripherals
- Newbridge
- Nokia
- Nortel
- NTI
- NUKO
- Olicom
- Optical Data Systems
- RADCOM
- Siemens
- Sprint
- Starburst
- Sumitomo
- Silicon Graphics
- Sun Microsystems
- 3Com
- Toshiba
- Whitetree

Microsoft joins Web proxy game

Users praise easy install and NT-based management.

By Christine Burns
Redmond, Wash.

Microsoft Corp. last week announced its Windows NT-based proxy server that gives administrators a secure, high-performance means of bringing Internet access to every corporate desktop.

Microsoft's Proxy Server 1.0 runs on top of Windows NT Server 4.0 and offers World-Wide Web access for an entire company through a single server using low-cost connections.

Proxy Server 1.0 is accessible via Microsoft's Internet Explorer and Netscape Communications Corp.'s Navigator. It supports common Web protocols, such as HTTP, File Transfer Protocol and Gopher, as well as non-Web protocols for streaming audio and video content.

Features of Proxy Server include an intelligent caching facility that gives end users quick access to commonly requested Web data; IP address aggregation, which hides a company's internal network structure; and tools for defining end-user and group Internet access, as well as deciding which Web sites will be off-limits to those behind the proxy server.

Users say a primary benefit of Microsoft's Proxy Server 1.0 over competitors' products is its integration with Windows NT. This integration lets users manage the Proxy Server with tools to which they are accustomed, such as Performance Monitor and NT User Directory Service.

"We already know NT pretty well, so getting this up and running was no bother, no fuss and no extra cost," said Barry Johnson, a technology consultant with The Systems House, a software firm in Rosemont, Ill.

The product will be available by the end of the month. An unlimited-user license is priced at $995.

©Microsoft: (206) 882-8080.

NT Proxy basics

Microsoft's first rendition of its Windows NT-based Proxy Server:

- Is based on the CERN standard
- Supports HTTP, FTP and Gopher protocols
- Features intelligent caching for high performance
- Includes tools for setting user access by service, port or IP domain
- Is accessible via all standard Web browsers
- Is manageble via Windows NT Server administration tools
- Supports IPX/SPX clients without modifications

WANs & Internetworking

Covering: Network Architectures and Management • Routers • Muxes, Remote Access Gear, Modems, PBXs and other CPE • Mobile Computing Products

Briefs

CrossComm Corp. *has rolled out a service designed to help users* **monitor traffic** *across their networks.*

Called ExpertWatch, the service features network baseline evaluation, health reports from a Web server, analyses by CrossComm engineers, and 24x7 monitoring and event management.

ExpertWatch will be available in January. Pricing starts at $10 per month per logical connection for basic reporting.

CrossComm: (508) 481-4060.

New Dimension Software *has announced WebShout, an option for the company's Control-O/PC* **system operation software** *that lets users access system alerts via a Web interface.*

Control-O/PC with the WebShout option is available now. Pricing starts at $23,650.

New Dimension: (714) 757-4300.

Shiva Corp. *and* **Enterprise Solutions Development Laboratories, Inc. (ESDL)** *last week announced Net2Com, software that lets Shiva remote access gear talk to Windows NT clients on a LAN. This will let users* **access remote locations** *through shared wide-area dial-up ports. Net2Com supports PPP connections and is available now. It costs $99 for a five-user license and $15 for each additional workstation.*

Shiva: (617) 270-8300; ESDL: (206) 462-2194.

ZyXEL Communications, Inc. *will introduce the Prestige 128 ISDN bridge/router at Comdex '96 in Las Vegas this month. Prestige does* **multiprotocol routing** *and transparent bridging. It also features a single-user account that lets multiple users at one site simultaneously access the 'Net using one IP address from an Internet service provider. Available at the end of this month, Prestige will cost $799.*

ZyXEL: (714) 693-0808.

Ascend gets into RADIUS security

By Tim Greene

Ascend Communications, Inc. last week said it will soon deliver a server software package that supports the authentication and authorization of dial-in users to corporate networks.

Access Control is Ascend's implementation of Remote Authentication Dial-In User Service (RADIUS) technology, developed by Livingston Enterprises, Inc., which expands the access central-site remote access gear has to authentication databases and other security systems.

While the package supports Ascend's Max and Pipeline families, it is also compatible with

See **Ascend,** *page 20*

Cisco has a new name for its top customers: 'Strategic'

IOS enhancements and partnerships are key to account control move.

By Jim Duffy
San Jose, Calif.

As Cisco Systems, Inc. ventures into fiscal 1997, the company has its sights set on gaining even more influence over customer buying decisions.

Cisco has established an enterprise marketing group with a mission to make Cisco a "strategic" supplier to its top 100 to 500 accounts. Cisco's definition of strategic is to gain enough trust from a customer that the buyer includes the company in network planning and purchasing.

Cisco appears to be attempting to gain tighter control over customer accounts by leveraging a product portfolio that stretches from the desktop to carrier points of presence, observers said. Though no other vendor can match Cisco's product diversity, the company has to be careful not to be perceived as a wolf in sheep's clothing with the intent of locking customers into a Cisco-only circumstance, they said.

To that end, Cisco is shifting from a business unit orientation to a market focus with an imperative to deliver "end-to-end solutions" to enterprise, service provider and small to midsize business accounts. The enterprise marketing group will chart its success by tracking product penetration, market share, revenue and profit margin, and whether Cisco is a strategic supplier to those accounts.

"We're supposed to elevate the way we sell and present messages, and support and service very large enterprise accounts," said Alex Mendez, vice president of marketing for enterprise networking at Cisco. "Rather than selling at the data manager level, we're going to try and sell at the CIO level."

Chief information officers should be prepared to hear Cisco tout its ability to deliver these end-to-end solutions from the myriad products it has obtained from the 14 companies it acquired during the past three years. Cisco is counting on its Internetwork Operating Systems (IOS) software to deliver consistent application and network services, and painless administration across its disparate and largely incompatible products.

Cisco has specific plans to extend the capabilities of IOS and proliferate it industrywide.

Cisco has branded portions of IOS as "IOS Technologies" and will market them to LAN adapter and network device suppliers to expand its stable of IOS partners. Cisco will also bolster the security, quality of service, voice networking and network management capabilities of IOS.

But one of Cisco's challenges will be in convincing customers that IOS is an open technology platform. Even though Cisco licenses IOS to the industry at large, some debate has arisen recently as to whether IOS is truly open or licensed by Cisco on a selective basis (*NW,* Oct. 21, page 9).

Cisco's *Alexander (left) and Mendez are responsible for making Cisco a "strategic" supplier to its largest accounts.*

"We have to concentrate on articulating the value of IOS with our customers," said Peter Alexander, director of enterprise networking at Cisco. "There are more standards in IOS than in other networkwide operating systems."

Cisco's success in articulating that message is key to overcoming arguably its most important challenge: to minimize the perception among CIOs that purchasing an end-to-end network from one vendor is risky.

"They don't want to get boxed into an IBM kind of relationship of the 1960s where they can't switch suppliers or platforms in and out of their network," Mendez said.

Some of Cisco's other challenges in executing this strategy include the execution itself. "As you get bigger, you have to organize to maintain entrepreneurship," Cisco's Alexander said. ■

Lucent intros reservation tool

By David Rohde
Anaheim, Calif.

The process of making reservations for a multipoint videoconference is the latest application to move to a Web browser interface.

Lucent Technologies, Inc. is introducing the capability as part of enhancements to its Multipoint Conferencing Unit/Conference Reservation and Control System (MCU/CRCS). The enhancements are incorporated in the recently announced Release 4.2 of MCU/CRCS.

The new reservation tool, dubbed Web.Res.Now, is designed for Internet or intranet environments. Demonstrated at last week's TeleCon XVI show here, Web.Res.Now is comprised of HTML pages and a Common Gateway Interface program.

Lucent officials also said they are making strides with Release 4.2 to let the MCU act as a bridge for switching voice, video and data calls in nets where some endpoints do not sit behind a PBX. For example, Lucent has increased the number of direct connections in the MCU to 36 stationside ISDN Basic Rate Interface ports. In such a fashion, the MCU acts as a video control unit and a PBX-like switch for dispersed users.

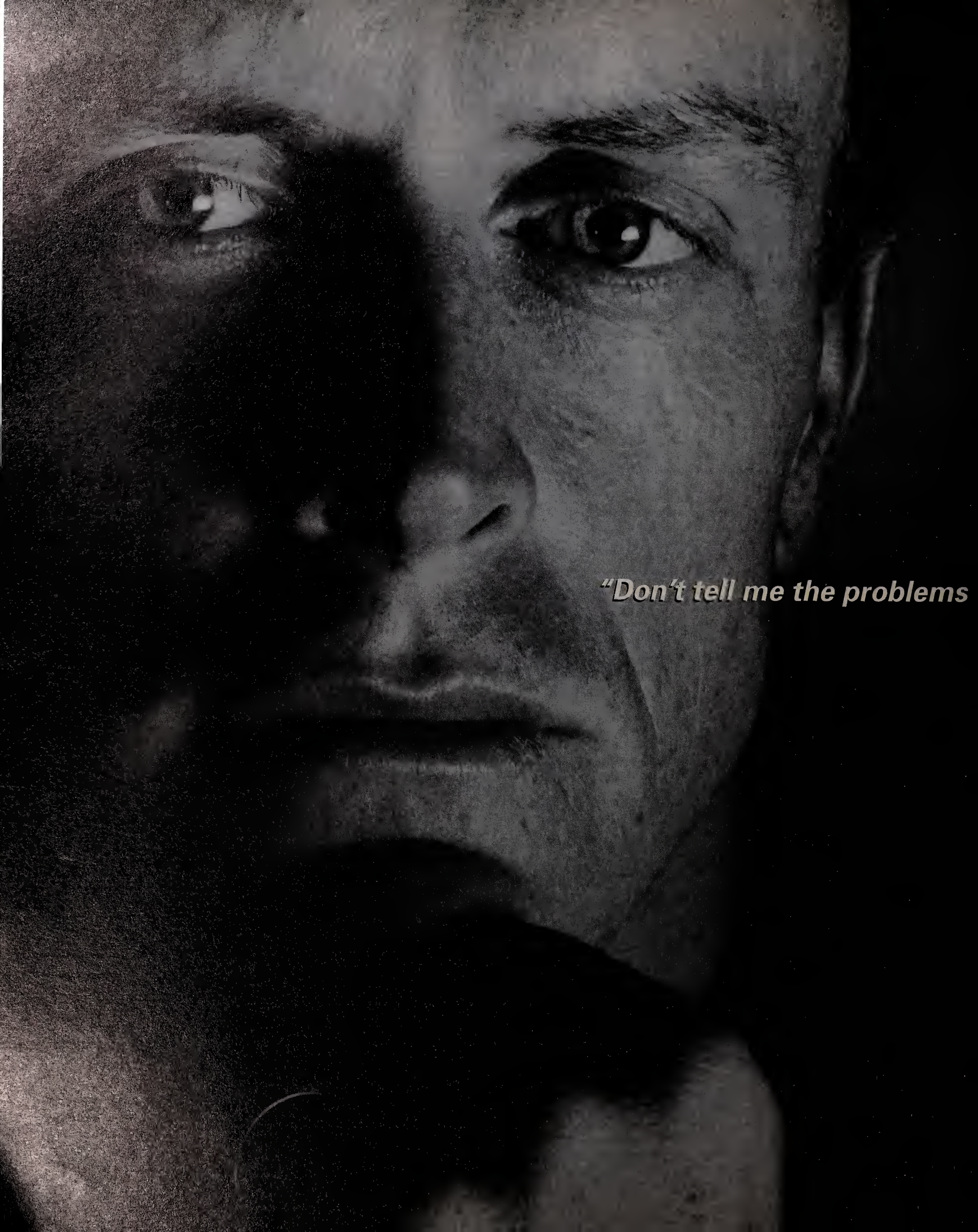
The aim is to let two or more parties conduct dial-up video or T.120 data collaborations in the same way as voice connections, with the ability to add or drop individuals on the fly, explained

See **Lucent,** *page 20*

CONFERENCING BELLS AND WHISTLES

Major enhancements in Release 4.2 of Lucent's Multipoint Conferencing Unit/Conference Reservations and Control System includes support for:

- Conference reservations over the Internet or an intranet
- Up to 36 stationside ISDN BRI ports to switch traffic
- Up to 25 parties in audio-only mode
- Bandwidth-on-Demand Interoperability Group standard
- Single-number dial-in for video participants and a separate number for audio-only participants



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NETBEYOND, THE EXTENDED NETWORK SYSTEM FOR SMALL AND MEDIUM-SIZED BUSINESSES.

Ascend

Continued from page 17

other RADIUS-compliant equipment.

"It is important for users to have a security policy that fits with their network platforms," said Ted Julian, a network security products analyst with International Data Corp. in Framingham, Mass. Integration of the remote access hardware with the security software is important from a management point of view, he said.

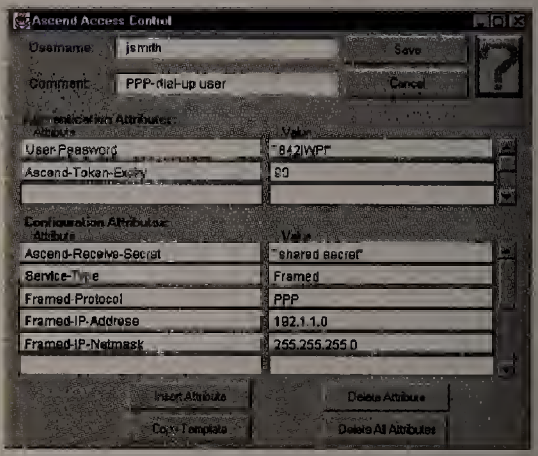
In a RADIUS configuration, the remote access server acts as a RADIUS client. It takes the name and password of the dial-in user and forwards it to the RADIUS security server, which passes it on to the security system being supported. That could include a token card or authentication by "realm" within a database.

Realms are levels of user access assigned to groups identified in blocks in a database. In a corporate network, one realm might describe access for the engineering department while another might define it for marketing. The realm is defined by the Access Control administrator, through a graphical user interface.

Access Control has an interface for Microsoft Corp.'s Open Database Connectivity, allowing access to specific databases including Sybase, Oracle and Informix, which can help define realms.

Firewall spec set

Separately, Ascend is publishing its proprietary Firewall Control Protocol (FCP) to let vendors of security products enhance its Secure Access Firewall.



Username: jsmith
Comment: PPP-dial-up user

Authentication Attributes:

Attribute	Value
User-Password	"842IWPf"
Ascend-Token-Expiry	90

Configuration Attributes:

Attribute	Value
Ascend-Receive-Secret	"shared secret"
Service-Type	Framed
Framed-Protocol	PPP
Framed-IP-Address	192.1.1.0
Framed-IP-Netmask	255.255.255.0

Ascend's Access Control *gives RADIUS a GUI.*

Companies that have said they would work on interoperability based on FCP include Raptor Systems, Inc., McAfee, AssureNet Pathways, Inc., Security Dynamics Technologies, Inc., Internet Security Systems, Inc., Haystack Labs, Inc., Optimal Networks and CryptoCard, Inc.

Access Control is available within 30 days for $3,000. FCP is available to developers now.

©Ascend: (510) 769-6001.

Lucent

Continued from page 17

Bruce Tillinger, a marketing manager at Lucent. "There's a trend to bring some of the features from the audio bridging market to the video bridging market," he said.

The new release also supports the Bandwidth-on-Demand Interopability Group standard, which allows multiple 64K bit/sec ISDN bearer channels to be reverse-multiplexed into a larger slice, such as the 384K bit/sec channel often preferred for high-quality video.

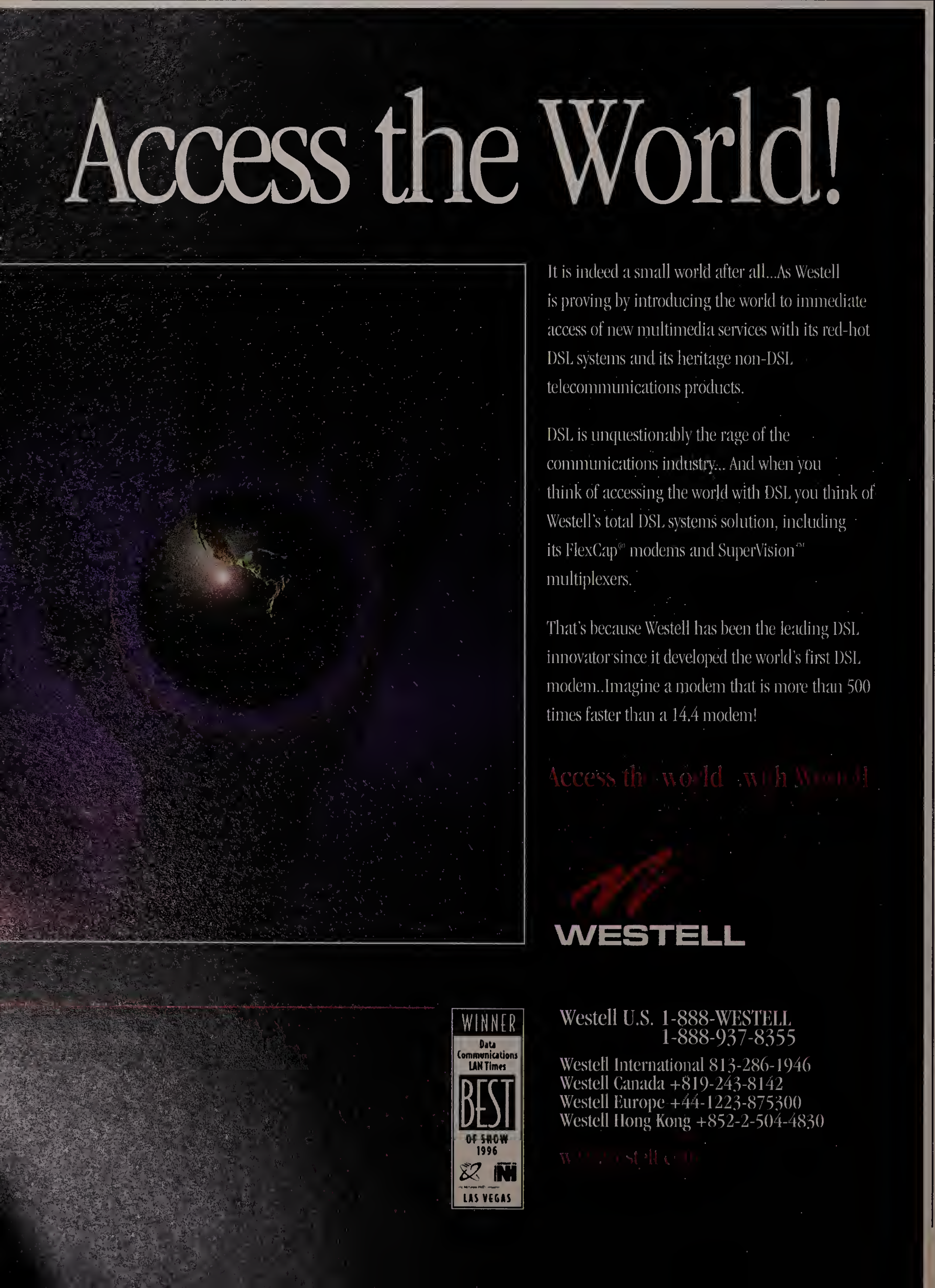
But Lucent officials said that in addition to increasing the number of video participants, net administrators are often as interested in providing audio-only abilities to videoconference participants.

So the vendor has increased the maximum size of an audio add-on conference to include 25 parties. In Release 4.2, all audio participants are given one phone number to use for dial-in, while video participants are given a different number.

Web.Res.Now will be available as a free download in the first quarter of 1997 from Lucent's MCU Web site (www.lucent.com/mcu).

Likewise, Lucent plans to begin shipping the MCU/CRCS Release 4.2 February 1997. Customers that purchase current 4.X versions of the MCU can prereserve Release 4.2 for $3,500.

©Lucent: (888) 458-2368.



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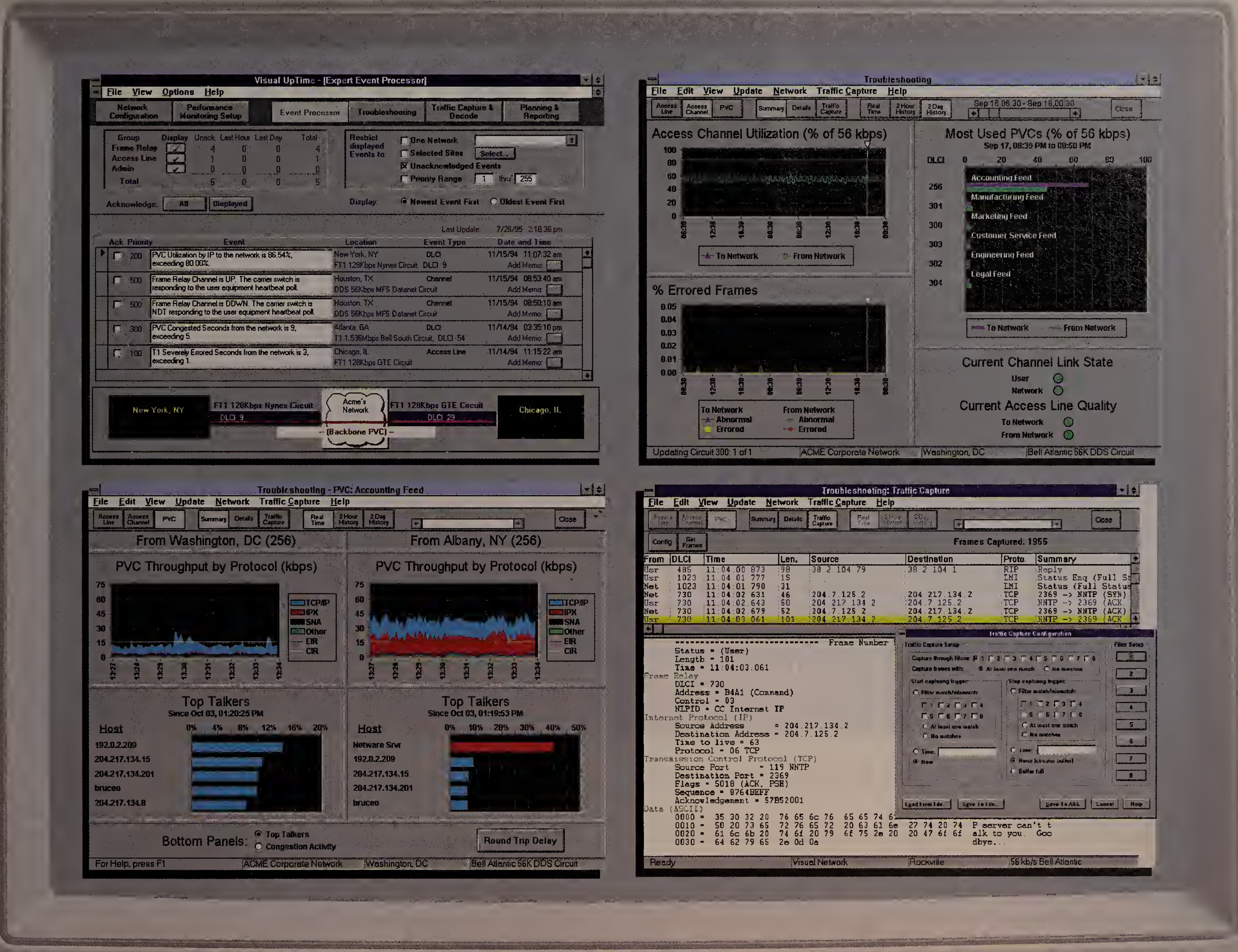

Group	Display	Unack	Last Hour	Last Day	Total
Frame Relay	☑	4	0	0	4
Access Line	☑	1	0	0	1
Admin	☑	0	0	0	0
Total		5	0	0	5

Restrict displayed Events to:
☐ One Network
☐ Selected Sites
☒ Unacknowledged Events
☐ Priority Range 1 thru 255

Last Update: 7/26/95 2:18:36 pm

Ack	Priority	Event	Location	Event Type	Date and Time
☐	200	PVC Utilization by IP to the network is 86.54%, exceeding 80.00%.	New York, NY FT1 128Kbps Nynex Circuit, DLCI 9	DLCI	11/15/94 11:07:32 am Add Memo:
☐	500	Frame Relay Channel is UP. The carrier switch is responding to the user equipment heartbeat poll.	Houston, TX DDS 56Kbps MFS Datanet Circuit	Channel	11/15/94 08:53:40 am Add Memo:
☐	500	Frame Relay Channel is DOWN. The carrier switch is NOT responding to the user equipment heartbeat poll.	Houston, TX DDS 56Kbps MFS Datanet Circuit	Channel	11/15/94 08:50:10 am Add Memo:
☐	300	PVC Congested Seconds from the network is 9, exceeding 5.	Atlanta, GA T1 1.536Mbps Bell South Circuit, DLCI 54	DLCI	11/14/94 03:35:10 pm Add Memo:
☐	100	T1 Severely Errored Seconds from the network is 3, exceeding 1.	Chicago, IL FT1 128Kbps GTE Circuit	Access Line	11/14/94 11:15:22 am Add Memo:

```
From DLCI  Time          Len. Source          Destination     Proto. Summary
Usr   485  11:04:00 873  98   38 2 104 79     38 2 104 1      RIP    Reply
Usr  1023  11:04:01 777  15                                   LMI    Status Enq (Full St
Net  1023  11:04:01 790  31                                   LMI    Status (Full Status
Net   730  11:04:02 631  46   204.7.125.2     204.217.134.2   TCP    2369 -> NNTP (SYN)
Usr   730  11:04:02.643  50   204.217.134.2   204.7.125.2     TCP    NNTP -> 2369 (ACK
Net   730  11:04:02.679  52   204.7.125.2     204.217.134.2   TCP    2369 -> NNTP (ACK)
Usr   730  11:04:03.061  101  204.217.134.2   204.7.125.2     TCP    NNTP -> 2369 (ACK
```

```
    ---------------------------- Frame Number
      Status = (User)
      Length = 101
      Time = 11:04:03.061
Frame Relay
      DLCI = 730
      Address = B4A1 (Command)
      Control = 03
      NLPID = CC Internet IP
Internet Protocol (IP)
      Source Address      = 204.217.134.2
      Destination Address = 204.7.125.2
      Time to live = 63
      Protocol = 06 TCP
Transmission Control Protocol (TCP)
      Source Port      = 119 NNTP
      Destination Port = 2369
      Flags = 5018 (ACK. PSH)
      Sequence = 8764BEFF
      Acknowledgement = 57B52001
Data (ASCII)
      0000 =  35 30 32 20  76 65 6c 76  65 65 74 6
      0010 =  50 20 73 65  72 76 65 72  20 63 61 6e  27 74 20 74  P server can't t
      0020 =  61 6c 6b 20  74 6f 20 79  6f 75 2e 20  20 47 6f 6f  alk to you.  Goo
      0030 =  64 62 79 65  2e 0d 0a                                dbye...
```

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Briefs

A war of words has broken out between carrier chief executive officers following a Missouri federal court's decision to halt implementation of the Federal Communications Commission's local competition rules.

McCormick

First, Richard McCormick of **US WEST, Inc.** *told the U.S. Telephone Association's annual convention in Atlanta that the FCC's rules forbidding regional Bell operating companies to count past investment in their nets when leasing network elements to competitors* **"makes me absolutely sick to my stomach."** *He likened the rules to forcing McDonald's to sell its hamburgers below cost to Burger King.*

Then, FCC supporter Bert Roberts of **MCI Communications Corp.** *told the National Press Club in Washington, D.C., that while he "sympathizes with [McCormick's]* **gastrointestinal disorders,"** *he suspected that he would not "be seeing Mr. McCormick as a poster boy for Big Macs."*

Roberts

Unlike monopoly RBOCs, Roberts explained, McDonald's does not have a mandate to "control all the cows" in the country. "The only Bell that's really interested in competition at this point is Taco Bell," he added.

In an attempt to counter Media One, Inc., a cable company planning to offer phone service in Atlanta, **BellSouth Corp.** *last week announced plans to* **buy Wireless Cable of Atlanta Corp. for $4.3 million.** *Wireless Cable provides wireless television services to 9,000 subscribers in and around the city. Media One is owned by US WEST, Inc.*

Diamond.Net touts clog-resistant ATM

Upstart controls access points by peering with the big boys.

By Tim Greene
St. Louis, Mo.

Apple Computer, Inc. needs bandwidth, big bandwidth, for its customer support center here. So the personal computer giant has decided to lease a fat 155M bit/sec OC-3 ATM pipe from Diamond.Net, Inc. in the belief that Diamond.Net's network is clog-resistant.

Driving Apple's decision was the promise that Diamond.Net's OC-12 ATM backbone will not become a bottleneck for Apple's traffic, according to Marty Suzuki, Apple's manager of network services.

But also of interest was Diamond.Net's scheme to avoid Internet bottlenecks by linking directly into the networks of the major Internet service providers.

Diamond.Net ties its customers into the Internet through private network access points (PNAP) it owns and maintains, an alternative to the standard public Internet NAPs and metropolitan-area exchanges where ISP networks come together.

Diamond.Net decided it was best, whenever possible, to avoid NAPs, which are notorious as Internet choke points, the cause of many brownouts, lost packets and aggravating delays.

Instead, Diamond.Net leases direct lines into the networks of five major ISPs. Customer traffic bound for destinations on those ISP networks is dropped onto the appropriate link by Diamond.Net routers in the PNAPs (see graphic). Avoiding NAPs improves response times, according to Gary Zimmerman, Diamond.Net vice president of network operations.

"We can't dictate how much they oversubscribe their networks, but we can get you on the right network right away," Zimmerman said.

Apple's Suzuki agreed it is a plausible way to reduce delay. "It would cut down on various connections and cut down on routing along the way," he said.

This kind of arrangement is commonly carried out among large ISPs, but not so often with smaller ones, said Eric Paulak, an analyst with Gartner Group, Inc. in Stamford, Conn.

He said the company gets high scores for its network plans, but until its net is running, it is too early to pass judgment.

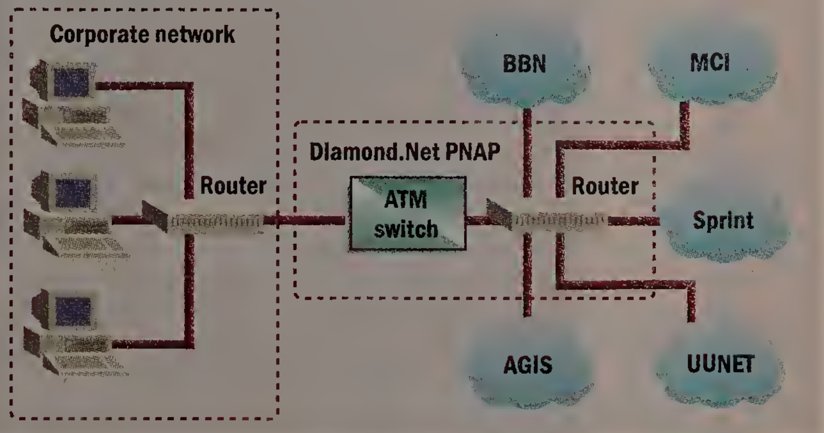
Diamond.Net is a year-old service provider that specializes in ATM. It is building a nationwide network out of leased lines and expects the project to be completed next spring.

The niche it is trying to carve out is that of a reliable, well-managed, high-bandwidth network, Zimmerman said.

To reach that goal, the company tries to keep ahead of bandwidth demand. Whenever sustained traffic on a single link in its network reaches 30%, the company buys more bandwidth.

Rates vary, but a DS-3 port costs about $6,000 per month and an OC-3 costs $15,000 to $18,000. Bandwidth is extra, and the company sells fractional DS-3s and OC-3s.

©Diamond.Net: (314) 727-5596.



AVOIDING CONGESTION

Diamond.Net is setting up private network access points (PNAP) so customers can tap directly into the private networks of major Internet service providers. This way, traffic jams at Internet NAPs and metropolitan-area exchanges (MAE) can be avoided.

Prospecting by phone, fax and Internet for sales gold

By David Rohde

AT&T last week offered up a hand to companies that want to generate sales leads over the telephone and the Internet but do not want a mishmash of prospect lists from incompatible systems.

Find out about AT&T's other competitors in the electronic transaction biz.

Enter the number to the right in the DocFinder box on the home page.

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The carrier introduced AT&T Prospecting Plus, a service aimed at companies that sell products through direct marketing but also want to boost their electronic commerce efforts.

Under Prospecting Plus, user companies devise a lead-generation tool, such as a questionnaire, and put it both on an interactive voice response (IVR) system and a Web site along with a hard-copy fax-back option.

But instead of having the responses collected by user-installed devices, they go directly to voice, fax and Web servers in the AT&T net.

Then, via AT&T's media-independent Electronic Commerce Services Transaction Platform (ECSTP), the responses are collected in a single data file that is downloaded twice a day to the user company. As a result, the user receives uniform prospect lists and integrated management reports instead of incompatible outputs from premises-based voice and data systems, explained Nancy Williams, national market manager for AT&T's Advanced Network Solutions division.

Prospecting Plus resembles the carrier's Order Express service, which originated as an AT&T-hosted IVR service for firms wishing to give their customers 24-hour-a-day telephone ordering and credit card validation.

As expected, AT&T last week also announced that Order Express is now available using fax and Internet customer interfaces, as well as telephony IVR.

All for a price

Both Order Express and Prospecting Plus come at a price: The user company must pay AT&T for each completed transaction, which in the case of Prospecting Plus means a sales prospect who may or may not buy something.

AT&T officials did not reveal the per-transaction charge for Prospecting Plus, but Williams said it would not necessarily be lower than the Order Express charge even though sales prospects do not immediately generate revenue. "Getting qualified leads is a very valuable activity," Williams said. "And it can be almost as expensive as taking a direct order."

Subscribers to Prospecting Plus may also incur a onetime charge for application design and development. Those who want to prospect for sales leads on the Internet can have their entire Web site hosted by AT&T through the carrier's Easy World-Wide Web (EW3) service, Williams said.

Alternatively, they can have certain pages — or a specific site devoted to lead generation — hosted by EW3 while maintaining their own administration for other Web activities, she said. ■

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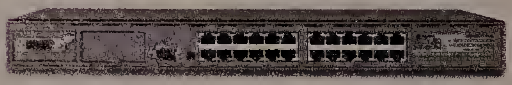

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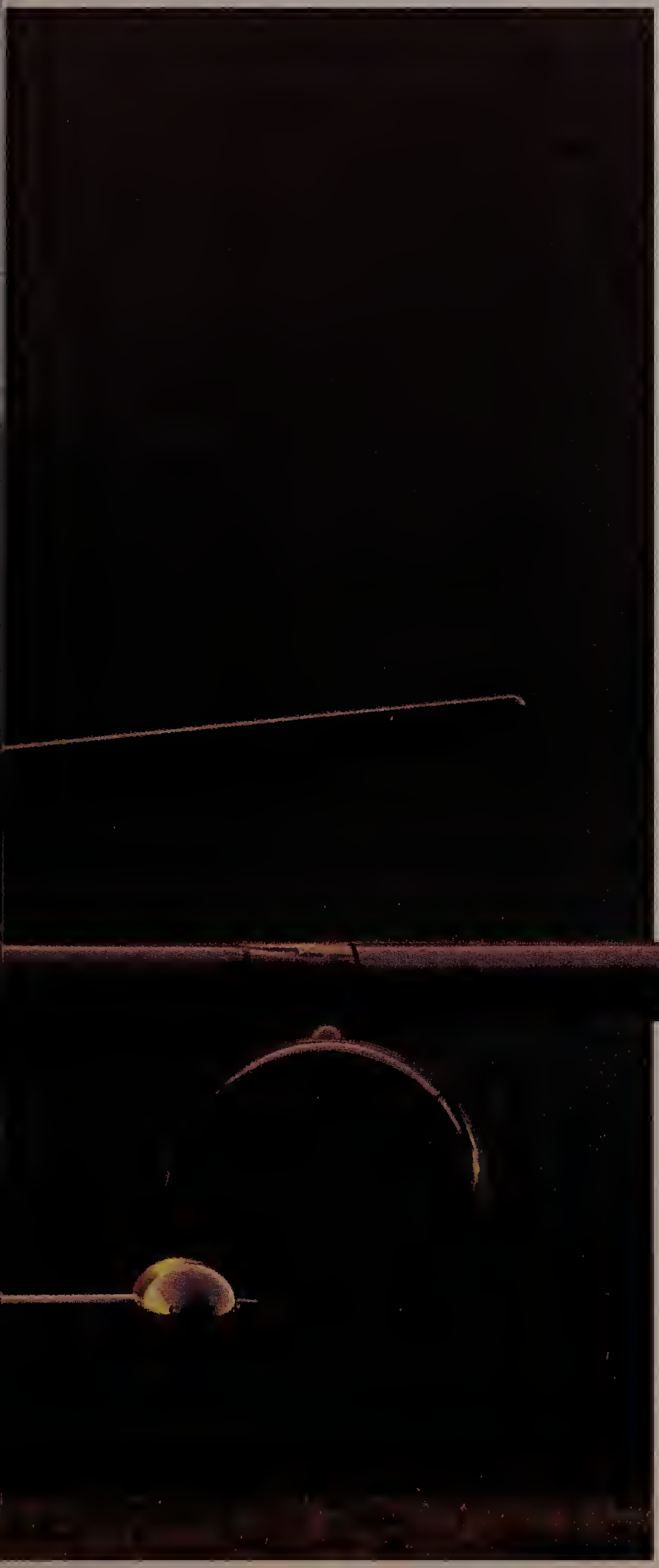

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Sayonara SOHO; hello SOHOROVOWOMO

Every day, people in our industry make up new words and acronyms to describe their products and ideas. Some catch on, while many fall by the wayside. As consultants, we hear about many ideas that never make it to the street, and it's a very good thing they don't.

For example, the ATM standards alone have enough acronyms that a new alphabet, one with 32 letters and seven astrological symbols, is being considered.

We got a little carried away at lunch one day after working on some product launches involving the fairly well-accepted acronym SOHO. Someone said, "it should really be SOHORO," for small office/home office/remote office. (We decided this should be pronounced soHOro, and not SO-HO-RO.)

How about adding "VO" for virtual office or "WO" for wireless office? And then there's mobile office. SOHOROVOWOMO! (We couldn't agree on the pronunciation of this acronym.)

Indeed, in working to design applications for the end-user markets, the whole confluence taking place outside the main office (OTMO) is making it hard to define where business ends and personal life begins.

As managers of enterprise networks, categorizing your employees as OTMOers, SOHOers or SOHOROVOWOMOers may seem somewhat inconsequential.

At first glance, we thought a "FO" might be appropriate for foreign office, but then we considered the other possible meanings for this acronym and decided we didn't want to offend anyone. So we dropped it. After awhile, all thoughts about not offending people were dismissed, and the conversation really got interesting.

Back office would be BO, which goes nicely with HO to make HOBO; but you really wouldn't have a home office as your back office unless you were a small home business. So there wouldn't be many HOBOs.

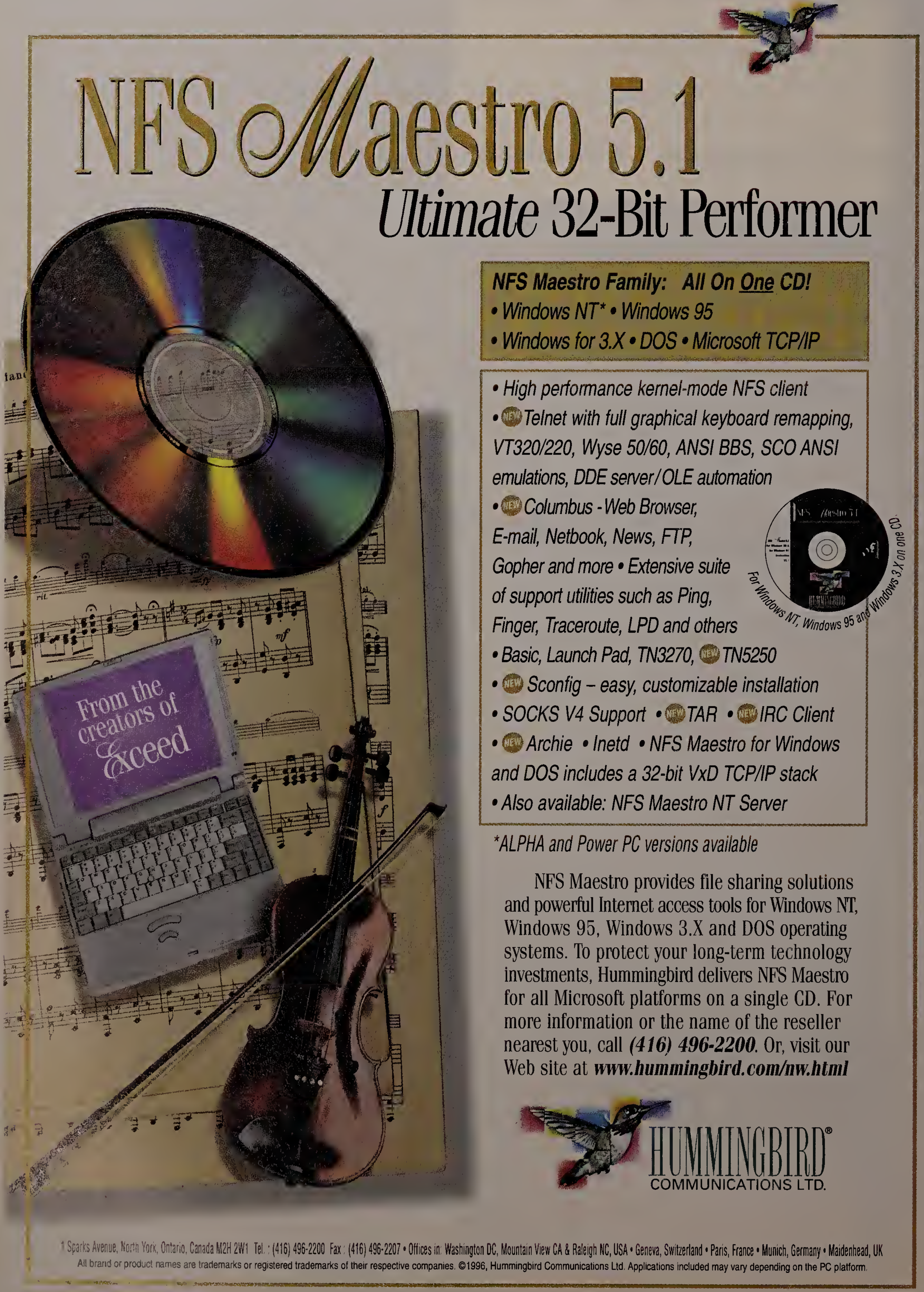
Daniel Briere and Christine Heckart

Imagine if the acronyms we know today were just a little bit different. Instead of Asynchronous Transfer Mode, maybe we would have Cell Relay Access Platform (figure it out) or EFEP for Engineer's Full Employment Plan. Instead of FRADs and PADs, we would have generic Multiplexing Access Devices (MAD). The central office switch that does everything — the ultimate black box — would be a central office widget (COW). There would also be OOPs, or object-oriented platforms.

Remember the days of the "brouter," or a cross between a bridge and a router? In the late 1980s and early '90s, there was a lot of differentiation between routers, bridges, FRADs, switches and concentrators. Today, nearly all this functionality can be found, to a greater or lesser degree, in each of these devices. No one bothered to create new acronyms, but if we had, the industry might now have Roaches (a combination of routers, access devices and switches).

At this point, the lunch conversation began to degenerate.

Briere is president and Heckart is director of broadband with TeleChoice, Inc., a consultancy in Verona, N.J. They can be reached at dbriere@telechoice.com and checkart@telechoice.com.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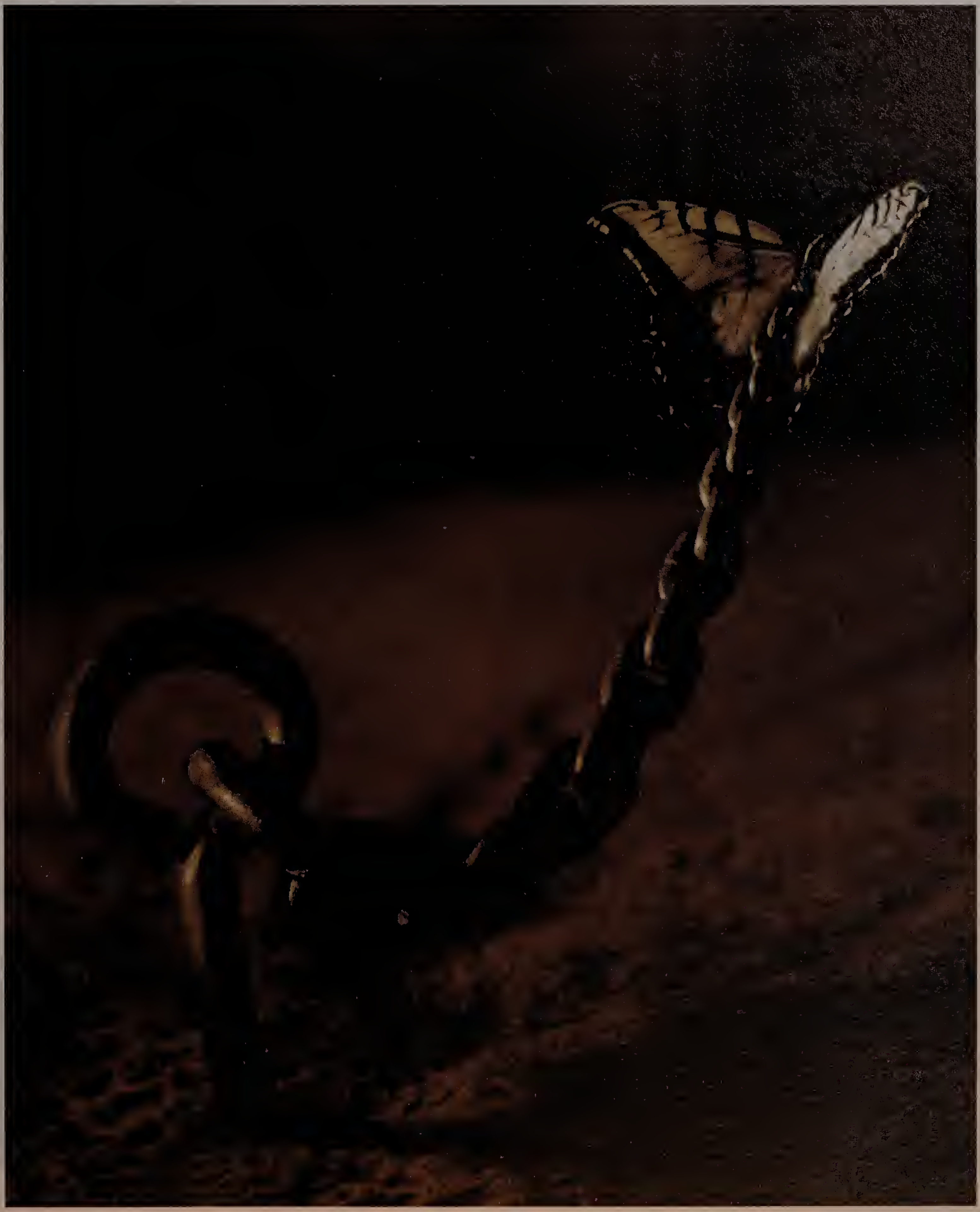

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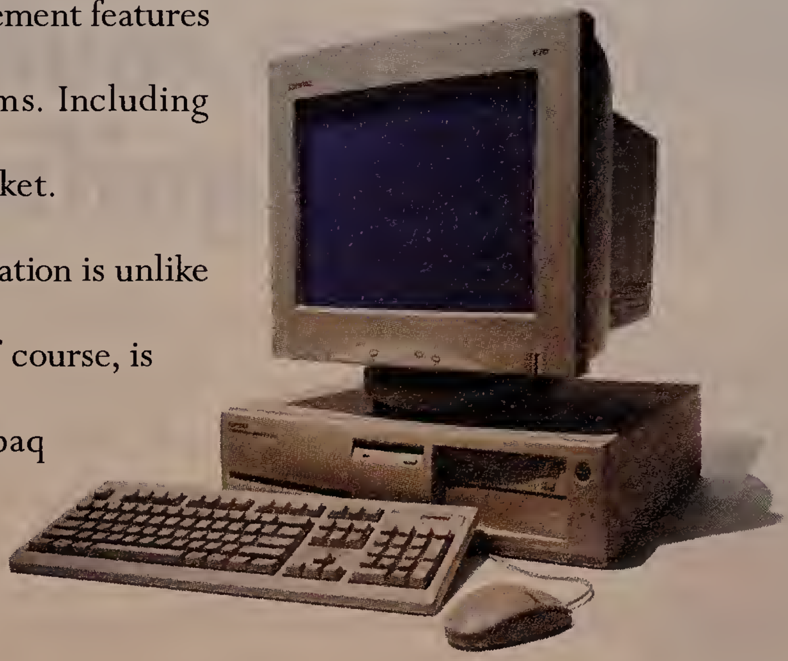

So what's under the hood? 1–2 200MHz Pentium® Pro processors with NT 4.0, a 256K cache, up to 512MB of ECC DIMM memory, an Ultra-Wide SCSI controller, and advanced 2D/3D graphics accelerators.

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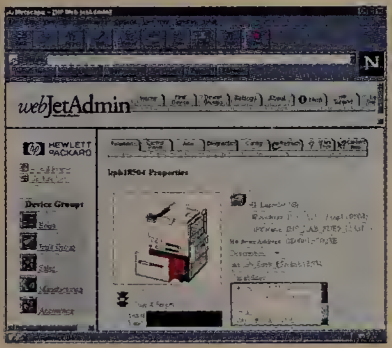
Briefs

Microsoft Corp. *last week announced it* **will license FORE Systems, Inc.'s ForeThought** *ATM LAN emulation software for integration with future versions of the Windows operating system. This is expected to ease the transition from Ethernet or token-ring LANs to ATM networks by lettings users run existing network applications unchanged over new ATM gear.*

Microsoft: (800) 426-9400.

Hewlett-Packard Co. *this week will unveil an intranet-based version of its* **JetAdmin** *family of printer management software that makes it possible to manage network printers from a Web browser. Web JetAdmin also includes an intranet mapping capability and a three-tiered security model.*



Web JetAdmin is available now at no cost from HP's Web site (www.hp.com).

HP: (415) 857-1501.

Cabletron Systems, Inc. *last week unveiled high- and low-end* **ATM switches.** *The announcements at NetWorld+Interop London, which were expected (*NW, *Sept. 23, page 1), included the Multi Media Access Center-Plus (MMAC-Plus) SmartCell switch that offers as much as 75G bit/sec of switching capacity. On the low end, Cabletron rolled out its SmartCell ZX-250 ATM family of Application Specific Integrated Circuit-based 2.5G bit/sec workgroup switches.*

MMAC-plus SmartCell will be available in the first quarter and cost $4,000 per port. The SmartCell ZX-250 switch family will be available in 90 days with pricing starting at $7,995.

Cabletron: (603) 332-9400.

Too small for VLANs

VLANs aren't worth the hassle in nets with fewer than 500 users.

By Jodi Cohen

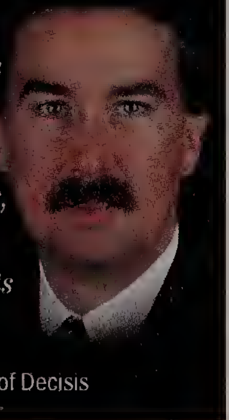
If your network is small, you may not need VLANs at all.

At least that is what some analysts and users contend. Virtual LANs — logical groupings of dispersed end users across a switched network — probably are not worth the trouble for customers running networks with 500 or fewer end users, some industry observers said.

Smaller networks do not benefit much from VLANs because they do not suffer from broadcast traffic problems. And one of the key features of VLANs is the ability to control broadcast frames within a subnet (*NW,* Oct. 28, page 1).

"I wouldn't even bother with VLANs in that case," said John Scoggin, chief technical advisor in the telecommunications infrastructure services unit at Delmarva Power & Light Co. in Wilmington, Del. "It's not worth all the aggravation."

VLAN management can be particularly complex, analysts said. For example, tracking which user belongs to which subnet, and whether they can belong to more than one virtual workgroup, can be a nuisance.



"The big benefit I see to VLANs is controlling and containing broadcasts [in large networks]. If you've got fewer than 500 workstations, your network is small enough that broadcasts aren't an issue."

David Passmore, president of Decisis

David Passmore, president of Decisis, Inc., a consultancy based in Herndon, Va., agreed that smaller networks need not be complicated by VLANs.

"One rule of thumb is if you've got fewer than 300 to 500 workstations at a site, you don't even need to be talking about VLANs because broadcasts are not an issue," he said. "You can go ahead and have a nice, big flat switched network at that site, and that's great."

But John Morency, principal at The Registry, Inc., a consultancy in Newton, Mass., is not so sure about using the 500-user mark as a cutoff point for deciding whether to deploy VLANs.

"I don't know where someone came up with the 500 number," he said. "Maybe they are assuming that if you have a flat network and your user population exceeds 500, then you may experience multiprotocol broadcasts and multicasts that have the potential of reaching an unacceptable level."

But Morency said a network of just about any size can benefit from VLANs. "If you can centralize servers for more efficient management, get some performance gains, and simplify adds, moves and changes, I would argue that those benefits can — and have been — delivered in [smaller] networks," he said. ■

Novell and IBM ship NetWare for SAA upgrade

By Christine Burns
London

Novell, Inc. and IBM last week unveiled an enhanced version of NetWare for SAA that is easier to administer and costs significantly less than previous versions of the gateway.

The announcement of NetWare for SAA 2.2, which was expected (*NW,* Oct. 28, page 6), is the first revision since IBM took over development of the industry's leading LAN-to-host gateway product from Novell in September 1995.

The new features include native support for Novell Directory Services (NDS), which eases administration and end-user access, and TN3270E support, which allows SNA users to connect to mainframes over TCP/IP and eases printing. Additionally, an Advanced File Transfer Protocol/File Transfer Protocol gateway lets users access files located anywhere on the network via a Web browser and provides support for 32-bit APIs that allow Windows 95 and Windows NT application access to data stored on legacy systems via the gateway.

Pricing for NetWare for SAA has been changed from a per-session model to a per-user one, a switch that Novell product manager William Gaskill said could result in savings of as much as 40%.

Cindy Borovich, a research manager with International Data Corp. in Framingham, Mass., said NDS integration and the new pricing model are critical features that will help IBM and

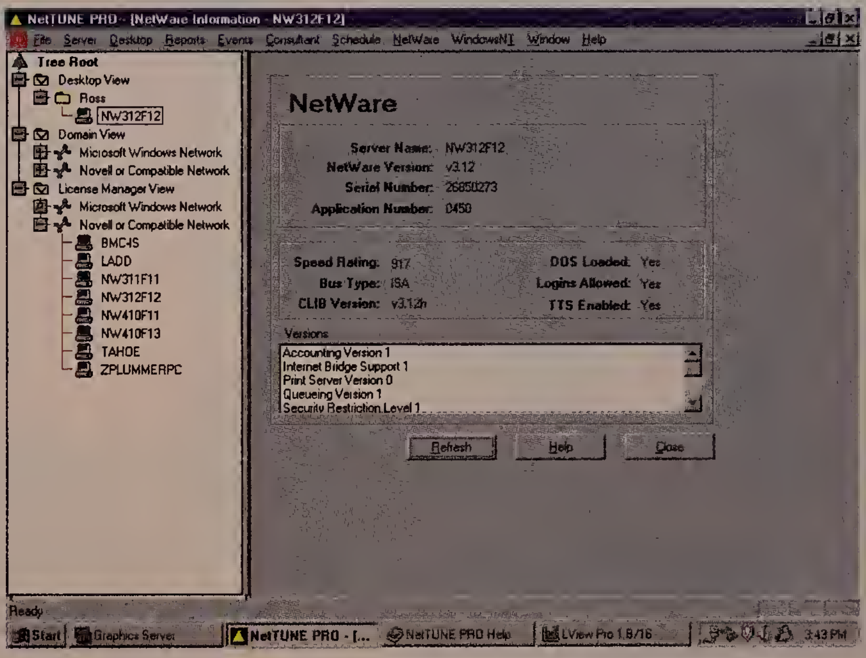
See Upgrade, *page 34*

BMC ships cross-platform server management tool

By Christine Burns
Houston

BMC Software, Inc. last week announced an enhanced version of its server performance tool that gives administrators the ability to monitor and change parameters for both NetWare and Windows NT Server machines from a single console.

The agent software monitors 124 NetWare and 13 NT Server parameters, pinpoints real or potential performance problems, makes recommendations to remedy those problems and automatically tunes server parameters without taking the server down.



NetWare

Server Name: NW312F12
NetWare Version: v3.12
Serial Number: 26850273
Application Number: 0450

Speed Rating: 917
Bus Type: ISA
CLIB Version: v3.12h
DOS Loaded: Yes
Logins Allowed: Yes
TTS Enabled: Yes

Versions
Accounting Version 1
Internet Bridge Support 1
Print Server Version 0
Queueing Version 1
Security Restriction Level 1

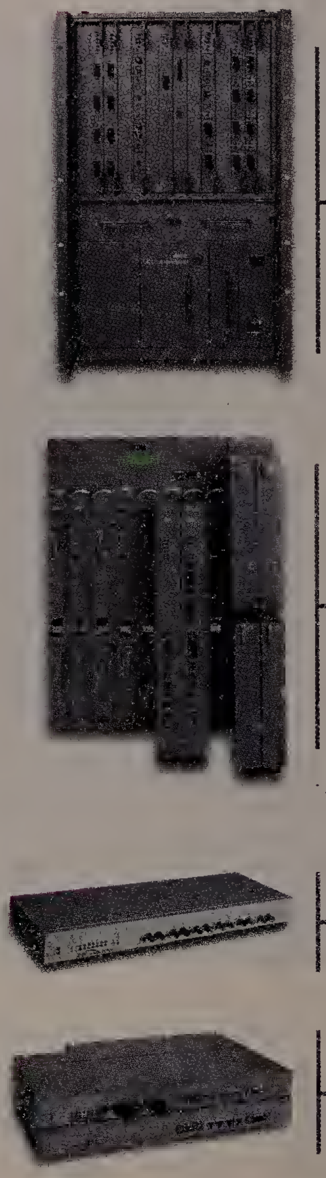
BMC Software's NetTune Pro 3.0 *gives users of mixed Windows NT Server and NetWare environments a common server monitoring tool for use across platforms.*

With NetTune Pro 3.0, administrators can dynamically fine-tune distributed NetWare and NT Server machines for varying application loads, improving server uptime and application availability to end users.

NetTune Pro 3.0 was originally developed for NetWare-only environments three years ago by HawkNet, Inc., which BMC acquired last November. The product comprises agent software for NetWare and Windows NT servers, as well as a new 32-bit graphical user interface-based console that sits on either a Windows 95 or Windows NT workstation.

NetTune Pro makes all server performance data available in real time, or stores it in a historical database that can be used to generate reports on server performance. A new custom reporting feature provides more

See BMC, *page 34*



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WIRED WINDOWS

Next Windows releases up in the air

A number of details about the next releases of Microsoft Corp.'s Windows 95 and NT operating systems have come to light in the past few weeks.

The Nashville release of Windows 95, originally scheduled to be available late this year, has evidently been scrapped — although some would have you believe that the recently shipped Service Pack 2 (SP2) was Nashville.

Dave Kearns

That might be believable, except SP2 was not, is not and will not be available as a retail package. Many of the SP2 features, however, will be rolled into Memphis, the next major release of Windows 95.

The SP2 features will include automatic data recovery, which allows for automatic repair of files damaged because a machine was turned off without being shut down, and the Fat32 advanced file system which handles large drives better.

Memphis will also include an Internet Desktop motif, some TCP/IP routing functions, the NetWare 4.X redirector for Novell Directory Services (NDS), and Internet agents capable of monitoring Internet sites and alerting the user to content changes.

The next major release of Windows NT, code-named Cairo, will be known for the introduction of Microsoft's Global Directory System, which has been long anticipated and long delayed.

It's based on a combination of Kerberos authentication coupled with X.500 directory services and an access point for the Lightweight Directory Access Protocol.

In documents I've seen, however, the phrase "Trust Relationships" is still used, reminiscent of Microsoft's maligned Domain system. Whether this will be too little (not scalable for the enterprise), too late (long after Novell's NDS for NT and Banyan's StreetTalk for NT) or both remains to be seen.

Other than the Global Directory, little is known about what, if any, further improvements will be contained in Cairo.

Just a couple of years ago, Microsoft's blueprint showed Windows 95 and Windows NT converging into a single operating system with Cairo. This, evidently, is no longer the case. That could change, though, if Cairo's ship date slips into 1998 as many analysts feel it will.

As it is, there's nothing in Memphis or Cairo that makes them necessary upgrades. It's fortunate for Microsoft that there are currently no major desktop operating system alternatives.

Kearns, a former network administrator, is a freelance writer and consultant in Austin, Texas. He can be reached at dkearns@msn.com.

Tip of the week

NetSync Corp. has released WebPatch, a product that streamlines the process of distributing software patches and upgrades over the Web by transmitting only the difference between old files and new, not the full executable. Get all the information from http://www.webpatch.com.

IBM, Intel announce PC management plan

By John Robinson

Intel Corp. and IBM tried to upstage last week's network computer (NC) announcements by forming an alliance whose goal is to make PC management easier and less expensive.

While Sun Microsystems, Inc. was touting the arrival of its long-awaited thin client (see story, page 1), IBM and Intel countered by creating the Advanced Manageability Alliance. In the first phase of the alliance, Intel will incorporate IBM's Wake On LAN remote management hardware into its Fast Ethernet LAN adapters and LANDesk Client Manager software. IBM, in turn, will incorporate those products into its line of Pentium and Pentium Pro-based desktops.

The integrated software and hardware will allow network managers to perform a variety of remote management tasks, from tracking network and PC assets to upgrading and installing operating systems.

While IBM is offering NCs to help users control costs and simplify management, the company believes it is also critical to bring down the cost of managing PCs, said Rod Atkins, general manager of client products. "It really depends on what types of applications you want to do," Atkins said of the roles the devices could play. But Atkins and Frank Gill, executive vice president at Intel, agreed PC management costs need to come down to counter the threat of low-cost NCs.

The Advanced Manageability Alliance is the first fruit from Intel's Wired for Management initiative announced in September. That plan called for reducing annual PC management costs from an estimated $9,324 to $6,800.

As part of the alliance, Intel and IBM also vowed to develop next-generation products to ease installation, configuration and upgrade processes. These include the upcoming IBM LAN Control Client Manager software and Intel LANDesk Configuration Manager.

Gill said the new IBM PCs will be released in the first quarter. ■

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BMC

Continued from page 31

granular control over which parameters are monitored on a single server or on groups of servers.

"It gives me very accurate performance data across NT and NetWare servers, and then gives me a way to standardize reports for both types of systems, which helps with network analysis," said Jack Engle, a systems consultant for Corporate Computer Science, Inc. in Chicago.

Other features include a license manager to help administrators monitor concurrent usage and an event manager, which lets administrators define parameter thresholds. NetTune Pro 3.0 is available now and costs $895 per server.

☎ BMC: (800) 841-2031.

Upgrade

Continued from page 31

Novell fight off the threat of Microsoft Corp.'s Windows NT-based SNA Server gateway, particularly in larger installations. "NDS support gives an administrator a central place to grant users access to multiple gateways, which saves time and money," Borovich said. Under the current version of NetWare for SAA, user access must be defined manually at each gateway.

Native NDS support for SNA Server is expected early next year and is already sold on a per-user basis.

NetWare for SAA 2.2 will be available mid-December in 10-, 50-, 250- and 500-user packs, and will range in price from $2,495 to $34,495. Gaskill said incentive programs for additional savings would be offered to existing users. Details are not yet available.

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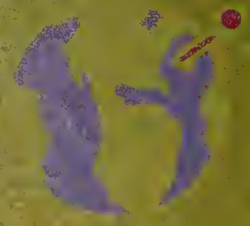

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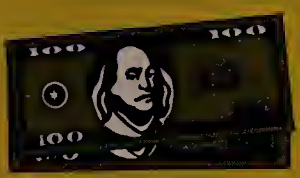

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Client/Server Applications

Covering: Databases • Messaging • Groupware
Conferencing • Imaging • Multimedia • Development

Briefs

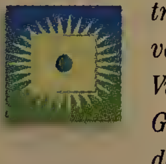
■ **FileNet Corp.** *of Costa Mesa, Calif.,* **is shipping Ensemble, its E-mail-based workflow software** *for Microsoft Corp. Exchange and Novell, Inc. GroupWise. The software lets users route work via the Internet and attach URLs to workflows. Users can also forward work from their electronic mailboxes to other mailboxes. Ensemble costs at $199 per user for a five-user license.*

FileNet: (800) 345-3638.

■ **JetForm Corp.'s** *Filler Pro electronic forms software now supports the* **Open Document Management API,** *a specification for sharing information across document management systems. As a result, Filler Pro can be used as a client for systems from Documentum, Inc., PC DOCS, Inc. and FileNet Corp.'s Saros division.*

JetForm: (613) 751-4800.

■ **UniData, Inc.** *of Denver is* **shipping Release 4.0 of its UniData relational database,** *which now supports 32-bit open database connectivity drivers and database triggers. The new version includes Visual Schema Generator, a Windows-based tool for modifying SQL tables. UniData 4.0 runs on Unix. UniData 4.0 is priced between $315 and $610 per license.*



UniData: (303) 294-0800.

■ **NetManage, Inc.** *last week announced that its WinSock SDK for Macintoshes will be included with Metrowerks, Inc.'s CodeWarrior development tool, enabling developers to use a common API to build networked applications for Macintoshes and Microsoft Corp.'s Windows. WinSock SDK is available now in CodeWarrior 10 and can also be purchased from NetManage for $250.*

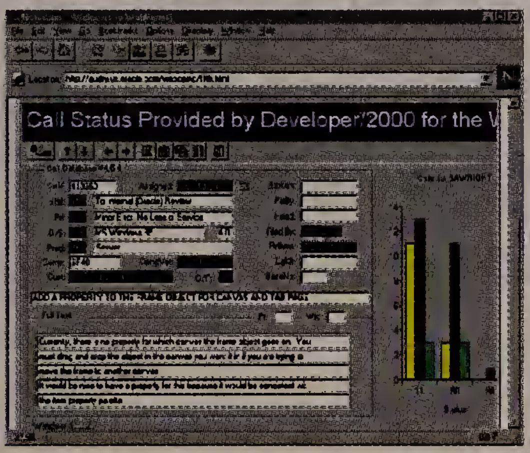
Metrowerks: (800) 377-5416; NetManage: (408) 973-7171.

Oracle and Powersoft ease move to Web applications

By Barb Cole

Oracle Corp. and Powersoft Corp. — two leading providers of application development tools — are separately readying software for deploying Web-enabled client/server applications.

The tools promise to help companies move beyond static Web publishing and into the realm of dynamic page generation, making it possible to customize content. Oracle's software is designed to move existing applications to the Web, while Powersoft's kit is for application development.



With Developer/2000 *for the Web, this call center application running inside a Web browser has active fields and the ability to process transactions.*

Oracle's Developer/2000 for the World-Wide Web, which will be announced today at the Oracle OpenWorld conference in San Francisco, runs on an application server and allows any client equipped with a Web browser to access the application.

The company currently offers a browser interface for Developer/2000, but it is limited to publishing information to a Web server.

Developer/2000 for the Web will present applications as Java applets and will support Oracle's Network Computing Architecture (NCA). NCA is a set of technologies that allow a variety of client platforms to work with Web servers and other application servers.

"It looks like we'll be able to take a lot of our existing [Developer/2000] applications and roll them over to a thin client deployment," said Thor Heinrichs-Wolpert, technical architect at the Ministry of the Environment in Victoria, British Columbia. This setup will promote easier deployment of software upgrades across the ministry's 4,000 desktops, he said. Pricing and availability for Developer/2000 for the Web was not available.

Powersoft progress

Powersoft last week announced Internet Developer Toolkit for PowerBuilder 5.0, an add-on to the PowerBuilder Windows application tool that includes both preexisting and some new components.

Additions to the tool kit bundle include the Web.PB HTML Wizard to walk developers through the process of building an HTML form, an HTML Class Library that generates HTML forms and a copy of O'Reilly & Associates' Web-site personal Web server.

Other tool kit components — previously available on the company's Web site — include Web.PB for connecting PowerBuilder application servers to Web servers and utilities that let users run PowerBuilder applications within browsers.

Most components in the PowerBuilder suite run on Windows. Web.PB also supports Sun Solaris. Available now, the tool kit is priced at $99.

Powersoft: (508) 287-1500; Oracle: (415) 506-7000.

There's more online:

- **A white paper on migrating from client/server to Internet-based development**
- **A library of documents about planning for client/server and Internet integration**
- **A paper on using a modified proxy server to give Web users access to client/server applications**

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VideoServer revs up its line

By Barb Cole

Anaheim, Calif.

VideoServer, Inc. used the TeleCon XVI Conference here last week to announce several enhancements to its line of multimedia conferencing servers, as well as technology for connecting high-end and desktop conferencing systems.

The VideoServer Conference Room for Intel Corp.'s ProShare Conferencing Video System 200 is a multimedia conferencing server (MCS) that supports Intel's ProShare and any H.320/T.120-compliant systems. The MCS lets users collaborate via multipoint audio, video and document conferencing.

Users answer four questions about their telephone service and ISDN network when setting up a conference and then simply dial in to join other participants. Conference time on the server can be managed using group meeting schedulers such as Microsoft Corp.'s Schedule+ and ON Technology, Inc.'s Meeting Maker.

Other announcements from VideoServer this week included:

■ Plans to bundle a set of conference management features with its servers. VideoServer's Conference Management for Service Providers is aimed at helping telephone carriers improve the quality of their service, according to Jack O'Neil, vice president of marketing at VideoServer. Features include a welcome message, on-hold music for calls, and testing of audio and video quality to ensure that the most reliable connection has been made.

■ New technology, dubbed Collaborates, which enables high-end conferencing systems to participate in a multipoint conference with lower end systems without conforming to the lowest transfer rates. Previously, endpoints of different transfer rates automatically dropped the entire conference to the lowest common node.

■ A gateway for connecting H.323-based conferencing systems with those based on the older H.320 standard.

■ An agreement with Cisco Systems, Inc. to integrate its gateway software and hardware with Cisco's IOS software for deploying conferencing over corporate networks and the Internet.

"[VideoServer] is trying to tie the desktop to the meeting room," said Carl Howe, an analyst at Forrester Research, Inc. in Cambridge, Mass. Howe said such technology is sorely needed. "The desktop [conferencing] market is growing fast, but most Fortune 1000 companies have room systems that need to be connected, as well," Howe said.

The VideoServer Conference Room for Intel ProShare Conferencing Video System 200 will ship next month. Pricing starts at $29,995. Conference Management for Service Providers is available now as a part of VideoServer's MCS.

VideoServer: (617) 229-2000.

PROFILE: VIDEOSERVER, INC.

Based:	Burlington, Mass.
Founded:	1991
Number of employees:	175
Revenue (1995):	$28 million
Primary products:	Multimedia conferencing servers
Competitors:	Lucent Technologies, Accord and Multilink

SHARED LOGIC

Office 97 looking good in 1996

As 1997 approaches, Microsoft Corp. is poised to release Microsoft Office 97 before the bell tolls.

In an effort to erase from our long-term memory the almost-1996 release of Windows 95, Office 97 will be available to large-volume accounts on Microsoft's December CD-ROMs. The rest of us will be able to puff out our credit cards on this new software at the end of January 1997.

Marc Myers

While I naturally treat upgrades that cost money with a certain disdain, a review of the feature list for Office 97 has given me cause to look forward to it. Of particular interest is Access 97, which has become the most powerful desktop database available; if only it ran on the server, as well, it could become a real contender for use in production environments.

The replication features of Access 97 will enable users at remote locations to work independently on subsets of data, and then later synchronize those updates with the primary database. That kind of functionality has been around for several years on server-based database management systems, but for a desktop database it's unusually robust.

When I started to explore the software interfaces that Microsoft is going to offer in Office 97, it became clear the company has taken on the task of integrating all of their desktop products, not only with each other but also with common client/server production environments.

Data Access Objects (DAO) Version 3.5, for example, provides an unprecedented level of software support for Open Database Connectivity (ODBC) databases, starting with Oracle Corp. and Microsoft SQL Server. It is now possible, with this DAO 3.5 upgrade, to access ODBC data sources from Microsoft front-end products, with a speed rivaling any standard C or C++ programming interface.

ODBCDirect is the trade name for this new database connectivity mechanism, which provides high-speed, optimized access to server-side data. What's best about ODBCDirect is that developers who have used Microsoft's DAO engine exclusively to talk to Access 2.0 or Access 95 will be able to engage ODBCDirect to talk to server-side databases with almost no modifications to the data access source code.

Access 97 also has a "Save as HTML" option and a "Publish to the Web" wizard. When you save to HTML, you have the option to output the datasheets, forms, reports and queries to static HTML pages.

Optionally, you can save to Internet Database Connector files, which allow you to maintain an active connection with the Access database from the Internet so Web pages are updated dynamically.

The "Publish to the Web" wizard provides a user-friendly, step-by-step process to create HTML templates from database objects, place them on the Web server and construct a first-draft home page.

While these advanced features of Office 97 are compelling for client/server shops, as one user said recently, Microsoft's support for mainframe connectivity is either underpublicized or nonexistent.

I agree. Microsoft's software geniuses create ever more interesting products for the desktop, and they have really paid attention to standard client/server tools, such as the ODBCDirect interface to relational databases. But when it comes to defining a workable strategy for rightsizing, Microsoft leaves it up to you to decide.

Myers is CEO of Client/Server Connection, Ltd., a New York-based software development company. He can be reached on the internet at mmyers@cscl.com.

Advertisement

Understanding ATM Traffic Management Specifications

By Fraser Street

The Traffic Management Specification version 4.0 (TM 4.0) is one of the ATM Forum's foundation specifications. It defines the ATM layer support required by higher layer ATM Forum service specifications such as LAN Emulation 1.0 and Audio/Visual Multimedia Services 1.0.

TM 4.0 specifies an updated traffic management service architecture. This new architecture refines three well-known service categories: Constant Bit Rate (CBR), non-real-time Variable Bit Rate (nrt-VBR), and Unspecified Bit Rate (UBR).

It also introduces two new service categories: real-time Variable Bit Rate (rt-VBR) and Available Bit Rate (ABR). The specification of ABR, which features a closed loop flow control mechanism based on feedback from the network, is one of the most significant contributions of TM 4.0.

Each service category provides a distinct Quality of Service (QoS) to its connections. Together, these categories meet the QoS requirements of a broad range of ATM network applications. For example, a delay-insensitive data application that uses a reliable transport protocol like TCP would find the quality of service afforded by the UBR or ABR categories to be most appropriate. But a delay-sensitive multimedia application would likely require the provisioned bandwidth and delay objectives of rt-VBR.

TM 4.0 specifies a set of performance objectives that define the QoS provided by each of the five service categories, as well as a set of mechanisms used by network equipment to ensure that the performance objectives of each individual connection are satisfied.

The QoS performance objectives defined in TM 4.0 include the cell transfer delay (latency), cell delay variation (jitter), and cell loss ratio. In addition, the UNI Signalling 4.0 specification enhances QoS signalling. QoS objectives for each connection are satisfied through the following mechanisms: traffic policing, call admission control, various forms of intentional packet and cell discard, and in the case of the ABR category, sophisticated flow control.

ATM™ ISSUES ANSWERS

As ATM equipment implementing TM 4.0 becomes available, users will quickly realize the unique benefits of QoS. Networks that conform to TM 4.0 will support integrated services (i.e. data, voice and video on a single network) by meeting the QoS requirements of each of these applications.

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Component development

New Intrinsa tool simulates workings of software components

Prefix speeds applications development process by checking interactions.

By John Cox
Palo Alto, Calif.

A new product from Intrinsa Corp. lets application developers simulate the interworkings of software components to uncover problems much earlier in the development cycle than before.

Intrinsa's Prefix is intended to speed the process of assembling applications from reusable software by checking how new components will interact with others. Prefix does this without having to go through the entire application.

The product is able to do this because it does not actually run the software program. Instead, it reads the source code file and builds a special representation — a model — of the program. Then a simulation program uses the model to mimic the application's behavior. Intrinsa has filed for several U.S. patents on this technology, which it calls Software Component Simulation.

"It steps through all the expressions and statements that make up a particular application function," said Jon Pincus, cofounder and chief technology officer at the start-up, based here.

Checks your work

Prefix finds errors, such as a function, that are accessing noninitialized memory, and creates a report in ASCII text, which can be read by a range of popular editors and word processors.

"The Prefix models are vital," Pincus said. "As software gets more and more componentized, you want to check that your component is working . . . just where it 'meets' other components."

Prefix is available now. It currently runs on Sun Solaris and HP-UX computers, and simulates C language programs. Intrinsa is about to begin beta-testing a C/C++ version for the Microsoft Corp. Windows platforms and, later, for Unix. Then it will create versions for the Java and Microsoft Visual Basic languages. Intrinsa also plans to simulate multithreaded applications running on multiple processors. These applications are especially complex.

SIMULATOR GETS A GRIP ON COMPONENTS

Product:	Prefix
Vendor:	Intrinsa Corp.
What it does:	Reads source code of software component, simulates the component's behavior and interactions and identifies errors
Benefits:	Early detection of software problems and confirmation of component interactions in complex applications
Limitations:	Initially only for C code on Unix platforms — C++, Java and Microsoft operating systems will be supported in coming months

Prefix complements a range of existing development tools, such as software configuration managers, load-testing and GUI-testing tools and run-time debuggers. Prefix simulations can be run early in the development cycle before the source code is compiled. It is not necessary to change the code or create and manage software test cases.

Prefix is priced at $40,000 for a 10-user license and a set of models for a given operating system. Additional licenses cost $4,000, which includes the simulator and access to the shared models.

©Intrinsa: (415) 614-0400.

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Web ignites fresh concern about managing applications

By John Cox

"I've been living with this problem of applications management."

Actually, John Brotherston, Web systems development manager at Bay Networks, Inc., has done more than that. With a little help from his friends, he has actually built a solution, or at least, a partial solution.

The evolution of enterprise networking, and increasingly that of the Internet and the World-Wide Web, has made managing distributed applications at once more urgent and more complex. Analysts warn that, without the right tools, companies will balk at deploying applications whose performance, response time and reliability cannot be ensured.

STEPS TOWARD APPLICATION MANAGEABILITY

1. Forge agreement on the appropriate levels of application performance and availability. Codify that agreement in written service-level document.
2. Review and revise your application development and deployment process to design manageability into new applications from the outset.
3. Assess existing applications to decide which ones will return the greatest value if they are well managed. Focus on the most important ones first.
4. If applications need to change quickly, consider automated change management tools. If they need to change often, consider a central repository to store previous and current software versions.
5. Create a workable technical support process that has the organization's backing.

SOURCE: PATRICIA SEYBOLD GROUP, BOSTON

"Applications management is the endgame we have to get to," says Paul Mason, program director for systems infrastructure software at International Data Corp. in Framingham, Mass. "It's the application that [really] matters."

Today, for the most part, MIS groups still rely on a blend of management tools — for Unix computers, for databases, for network devices such as routers — or the use of SNMP to collect some information from these tools and display the data on an SNMP-based management console.

"You can crawl through various system logs and discover events [recorded therein], but determining whether they're actually related to the problems the end users are experiencing — you can't easily tell that," says Susan Aldrich, senior consultant and editor at Patricia Seybold Group, Inc., a Boston-based technology research company.

Bay's Brotherston first ran into the problem at his previous employer, where his team built a Web browser front end to a data warehouse and its inventory of applications that was distributed in several sites around the world.

"We realized we needed a tool to distribute changes [to the applications] around the network on a consistent basis," he said.

The tool his team built, with software consulting firm Open Rules Corp. in Winchester, Mass., made use of a free rules processing engine, some Unix utilities and Sybase, Inc.'s SQL Server database manager. Brotherston took that experience and applied it to a customer service application being built at Bay.

That application lets Bay's resellers use Web browsers to connect with existing host-based programs running on Bay's corporate network. Bay is using Progress Software Corp.'s WebSpeed for Web transactions.

Still working with Open Rules, Brotherston's team has created the Web Migration System (WMS). The idea is to track the various parts of a complete Web application — from HTML files through Common Gateway Interface and Perl scripts, to security authorizations, SQL code and database tables — and move these together through the application's development, deployment, operation and maintenance.

"We were building transaction applications that were coming through the firewall to the corporate servers," Brotherston says. "We needed to manage that. We wanted to make it easy to distribute changes to these applications and to make sure the changes occurred [simultaneously] at the Web server and at the host."

WMS consists of CLIPS, a freeware rules processing program originally built for the National Aeronautics and Space Administration; the source code control system, which is part of the Unix operating system; Sybase SQL Server as the repository (but WMS can work with most databases); and AutoXfer, a Platinum Technologies, Inc. product for guaranteed distribution of software over a network.

Using the rules engine, Bay's software developers create a list of components for a given application, a set of processes or tasks to be done with them, and a set of instructions or rules that define the relationships and dependencies among the components and tasks. By clicking on the MIGRATE command, you can move all the components from development to systems testing, then to end-user testing and so on, to final deployment.

"It cuts the time for distribution and maintenance by very significant factors," Brotherston says.

The approach has proven so powerful that it's being used in a growing number of day-to-day operational uses. "Systems administrators found they can save workstation configurations and then migrate these out to restart workstations that have crashed or to update the end user's software inventory.

"[WMS is also] a seamless way of integrating various point systems that are part of the applications management process but now can be controlled centrally," Brotherston says.

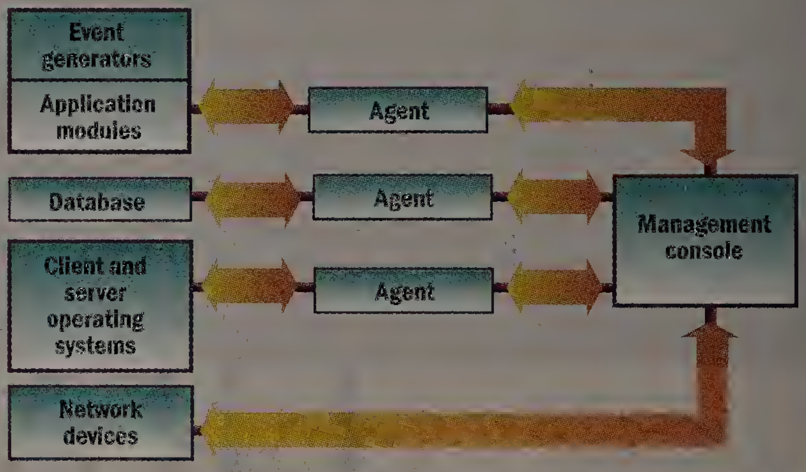
Bay's developers have created their project management utility that lets business managers review the status of bug fixes and features being added to the application. Eventually, Brotherston plans to create a three-dimensional user interface using the Virtual Reality Markup Language.

Bay's experience with WMS reveals several key elements MIS groups need to consider going forward. The first is simply the amount of work that has to be done to create the tools needed for managing applications.

"MIS groups are picking stuff they think will interoperate . . . . But they are left with the integration task, and that is not pretty," Aldrich says.

DESIGNING APPS FOR MANAGEABILITY

One approach to application management, shown here, extends the "agent" model being adopted for systems and networks. A new set of development tools now lets programmers build manageability features into their applications. Management events then are passed to agents, which share the information with higher level management console. The console programs let the administrator exercise some control over the application.



Second, WMS has the beginnings of a more abstract view of management information than more specialized tools. "Typically, management tools will tell you things like, 'between this router and that hub, average bandwidth utilization was X.' But what customers want is something higher: 'What's my average customer service response time?' " Aldrich says.

Third, WMS is facilitating, if not forcing, a much closer working relationship between those who build applications and those who administer them. "We found the core problem in deploying client/server applications was the lack of communication between developers and administrators," says John Savage, product marketing manager for applications management at Tivoli Systems, Inc. in Austin, Texas. "Administrators found themselves having to deal with applications about which they had very little information. This is the case with every one of our large customers who are building their own applications," he says.

A small army of vendors are addressing all these areas. In general, they share the idea of a framework that lets an application generate, report and store information specifically related to its health or performance. Those applications are said to be "instrumented," and their design also requires rethinking which operations staffers need in a manageable application.

Tivoli has proposed its Application Management Specification as an open, standard way to specify management information. Meanwhile, Platinum has devised its Platinum Open Enterprise Management System, a set of management services that can manipulate data passed along by software agents. Microsoft Corp. in July launched its own standards effort called the Web-based Enterprise Management (WEM) proposal. WEM is intended to integrate an array of relevant existing standards — SNMP, the desktop management interface and HTTP.

The Microsoft-led group has also outlined for the Internet Engineering Task Force a data model called the HyperMedia Management Schema, and a communications protocol, called the HyperMedia Management Protocol. Together, these technologies could represent how management data would be represented, manipulated, shared and accessed by management applications. ■

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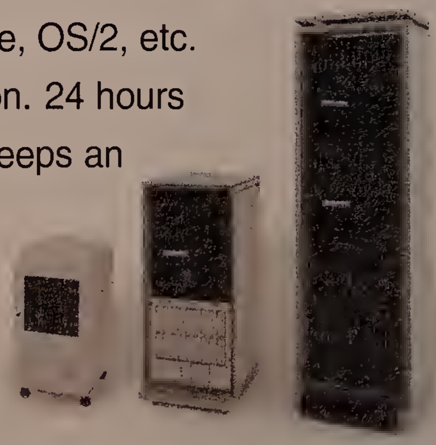

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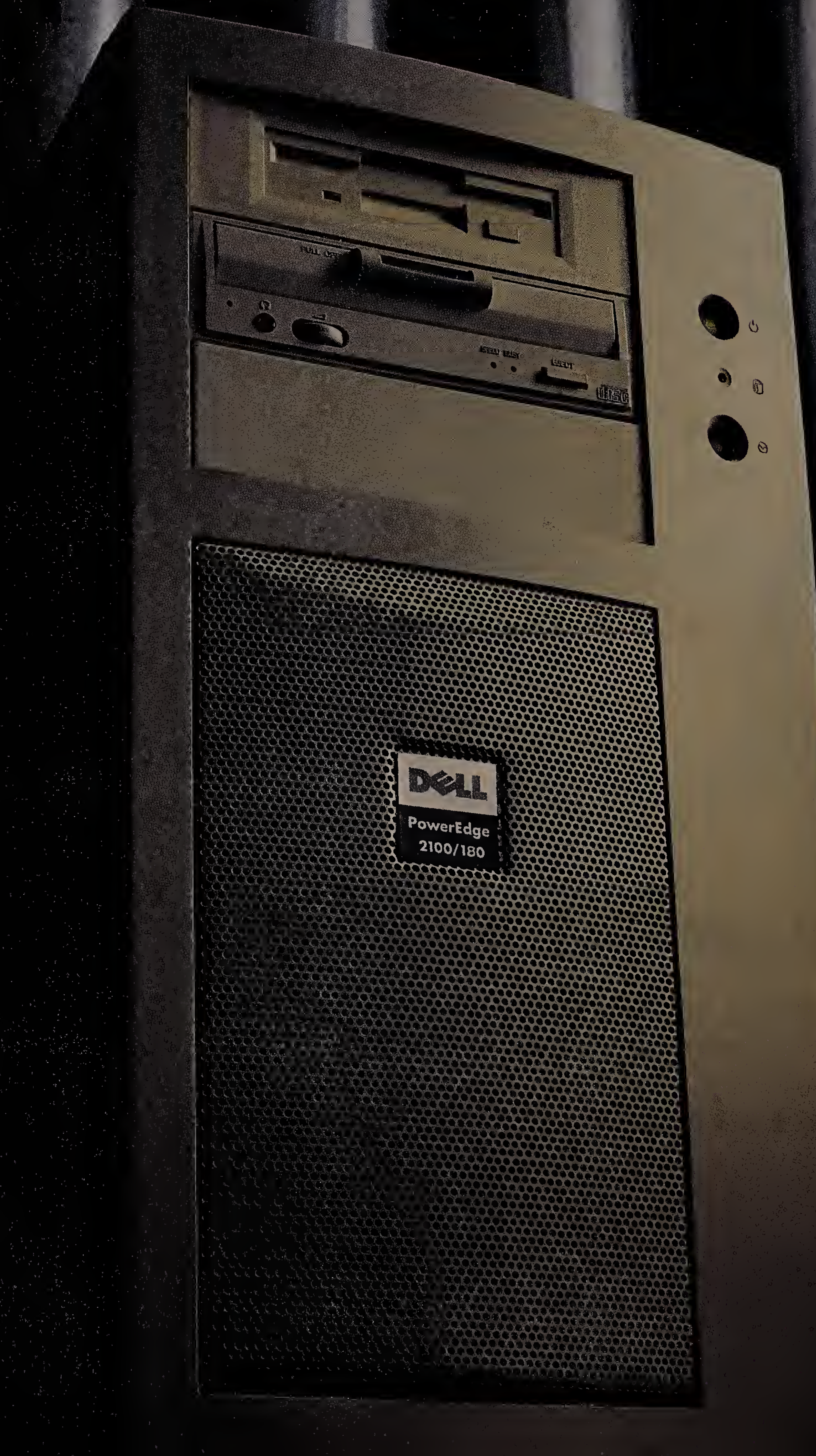

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Briefs

■ *Under sponsorship of the Defense Advanced Research Projects Agency,* **Trusted Information Systems, Inc. (TIS)** *has developed software for ensuring the* **integrity of Internet IP addresses.** *The beta is available for free download at www.tis.com/docs/ research/network/dns.html.*

TIS: (301) 854-6889.

■ **CompuServe, Inc.** *said the U.S. District Court of the Southern District of Ohio has granted a temporary* **restraining order** *prohibiting bulk E-mailer Cyber Promotions, Inc. from falsely identifying its mailings as coming from CompuServe.*

■ *After seven months on the World-Wide Web at www.tipworld.com,* **TipWorld** — *a site copublished by IDG Newsletter Corp. and PC World's Online Services Group — said its daily E-mail broadcast of information about Microsoft Corp. and Lotus Development Corp. products now reaches* **300,000 subscribers.**

■ *A year after setting itself up as the world's first Internet bank,* **Security First Network Bank** *reported it has* **6,600 banking accounts.** *The bank said most of the initial deposits were small, but they increased as customers became more comfortable with 'Net banking.*

■ **Accent Software International, Ltd.** *next month will unveil Internet productivity tools called WebTamer that will be available as plug-ins for the Navigator and Microsoft browsers. The eight WebTamer utilities include AgentSoft Live-Agents to create* **personalized intelligent agents** *in Java that automate a Web browsing session.*

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Sun chock full of JavaBeans

By Ellen Messmer

Sun Microsystems, Inc.'s JavaSoft division has nearly completed JavaBeans, a Java-based component API to let software developers write reusable software components that can be employed under an array of software development environments.

As JavaBeans components, everything from graphical user interface push buttons and toolbars to database viewers could be reused in different vendors' Java-based application builders — something that cannot be done today.

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The JavaBeans components could be compatible with a number of other component technologies, Sun claimed. For instance, JavaBeans objects could work in IBM's OpenDoc, as Microsoft Corp.'s ActiveX containers or with Netscape Communications Corp.'s LiveConnect tool for tying together Java applets, Web pages and graphics. "JavaBeans brings interoperability to a new level," claimed Jon Kannegaard, JavaSoft vice president. "Microsoft is spending millions of dollars on ActiveX, but this is better because it's platform-independent."

ActiveX currently runs on only Win32 platforms, though Microsoft is now trying to change that by porting ActiveX to Macintosh and Unix platforms under the aegis of The Open Group.

But JavaBeans has yet to face the interoperability proving ground in actual product implementations.

That test is coming. For instance, Borland International, Inc.'s Java development tool kit, Latte, due out this month, is "half-written in JavaBeans," according to Pat Vermont, manager of the Internet product group, who demonstrated Latte at the recent Internet Expo in Boston. Borland has been working closely with Sun on JavaBeans.

Vermont said there are no comparable products to test whether JavaBeans components written in Latte can be ported to other development environments. In December, JavaSoft plans to release a JavaBeans Development Toolkit that will include a test container, JavaBeans class files, JavaBeans source code and documentation.

But JavaBeans is not without controversy. "It's a contentious issue because Sun is claiming that anyone who licenses Java has to support Beans," Vermont noted.

JavaSoft executives admitted that the specification may still be a few beans short. JavaBeans still lacks LiveConnect support, though Netscape is working on it. The API still lacks an ActiveX hook — called OCX bridge to OLE — so a JavaBeans component could act as an ActiveX component, acknowledged JavaBeans architect Graham Hamilton.

"JavaBeans *brings interoperability to a new level," said JavaSoft's Kannegaard.*

Sun's JavaSoft division believes it will soon complete the JavaBeans OCX bridge in spite of Microsoft's lack of support for the initiative.

Charles Fitzgerald, Microsoft program manager for the Internet platform and tools division, commented with sarcasm on Sun's JavaBeans announcement. "JavaBeans is a specification, and there are a lot of specifications in this industry that never became real," he said. "Where are the tools? Will the performance be there? When JavaBeans is real, we'll support it."

Gina Centoni, Sun's JavaBeans line manager, said developers should pick JavaBeans over ActiveX because "the technology is better." But some consultants said that argument alone is not persuasive.

"It makes no difference at all whether it is or it isn't," said Clint Goss, consultant at Westport, Conn.-based CGC, Ltd.

"What will matter is whoever gets to the marketplace first to create a market where the bulk of developers can develop components out there and sell them," he said. ■

SunSoft cooks up JavaBeans tools

By Ellen Messmer
Mountain View, Calif.

Targeting casual and professional developers, Sun Microsystems, Inc.'s SunSoft division last week said it plans to ship four JavaBeans-based development tools by mid-1997.

Three of the tools — Java Studio, Project Speedway and Java Plan — will all be able to create software components based on the recently unveiled JavaBeans specification (see story, this page). The fourth tool will be a Beans-compliant version of Java Workshop, Sun's Java application development tool that is now available.

In theory, when Java software development tools are based on JavaBeans, programmers will be able to reuse components made with one vendor's tool in another vendor's application development environment.

According to Jon Williams, SunSoft's group marketing manager, the palette of JavaBeans components includes everything from a spreadsheet to a collaborative whiteboard to a database access interface.

For the neophyte who simply wants to pull together a graphic presentation combining HTML, ActiveX and Java, SunSoft is readying Java Studio, a visual assembly tool in which JavaBeans components can be manipulated by point-and-click operations.

SUNSOFT CRANKS OUT FOUR JAVABEANS TOOLS

Java Plan – For planning enterprise-wide Java applications

Java Studio – Point-and-click application for visual presentations

Project Speedway – Analysis tool

Beans-compliant Java Workshop – Allows software components to be used with another vendor's Beans-based tool

For the professional developer, SunSoft is readying Java Plan. "It lets the systems analyst model the business by defining where data resources and network facilities are located," Williams said. Once the analyst has a design in mind, Java Plan will generate about 30% of Java application automatically and allow the architect to specify how developers will collaborate on the project, Williams said.

Another JavaBeans tool under development, code-named Project Speedway, is a Java compiler that will work with a tool such as Java Workshop to compile Java code extremely quickly. Project Speedway can also profile how much time the Java application is taking to complete such tasks as windowing or running threads.

The next version of Java Workshop, SunSoft's current Java development tool, will be enhanced to include software wizards that let the programmer build the components automatically, Williams said. "Without the wizards, you'd have to have to follow the JavaBeans specification manually," Williams pointed out. ■

'NET INSIDER

The 's' word

Some words seem to evoke magical healing powers. Just say them, and somehow the path is clear, the future is bright, the frail made strong and the broken made whole. The networking business has had its share of magic words over the years.

In succession, we have seen people invoke such words as ISDN, OSI and ATM (that is, if you can call acronyms words) as beacons to one future or another. Each one came with the promise of the glory of easy and dependable networking to meet every need. Current favorites include TCP/IP, Internet and intranet.

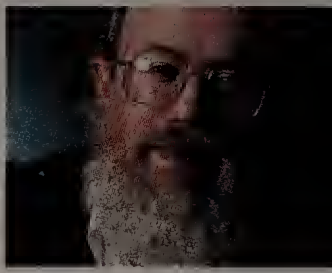
Now, a new word with the claimed ability to fix the Internet (whatever that means) is being chanted in various circles. But this word also strikes fear into the hearts of some. The "s" word is settlements — payments between Internet service providers based on the traffic flow between them.

Some people argue that if we had settlements among ISPs as we do among telephone companies, all of the problems with the Internet would be solved almost overnight.

If one ISP needs to pay a second ISP when the first ISP sends traffic to it, then the first ISP will insist that the second ISP be reliable. Others fear that establishing a requirement for ISPs to pay each other to exchange traffic will mean a fundamental change in the way people pay for their Internet service. The $19.95 per month flat-rate access would go the way of the 300-baud modem.

There are problems with both of these positions and some of the basic assumptions leading to the belief that traffic-based settlements might help fix some known problems such as lack of reliability.

The traffic flow between the largest ISPs turns out to be roughly symmetric. So if traffic-based settlements were to be established, any checks sent between ISPs would balance out. In fact, if each ISP were to send a check based on the sent vs. received balance of traffic, the checks would be for very small amounts and would generally cancel each other out over a few months. So for the big providers, the cost of establishing and operating a traffic-based settlements process would far outweigh the value of the return from the use of such a system. I do not see how getting the big ISPs to exchange small checks will do much for Internet reliability.



Scott Bradner

There is little issue of settlements for most of the small ISPs since they are customers and not peers, of larger ISPs and are treated the same way as any other customer.

Different factors must be considered when talking about the relationship between midsize and large ISPs at the exchange points. In these cases, the traffic balance may well be uneven, and having the smaller ISP pay the larger for the service of peering may give the larger ISP some incentive to provide better service. But it might be a good idea to be sure that the cure is not worse than the disease. In any case, just requiring traffic-based settlements will clearly not fix whatever problems you currently find with the Internet.

Disclaimer: The above must be my opinions since settlements at Harvard tend to be more one-sided than bilateral; if Harvard agrees, then you can pay a bunch of money to attend classes. (The learning part is up to you.)

Bradner is a consultant with Harvard University's Office of Information Technology. He can be reached via the Internet at sob@harvard.edu.

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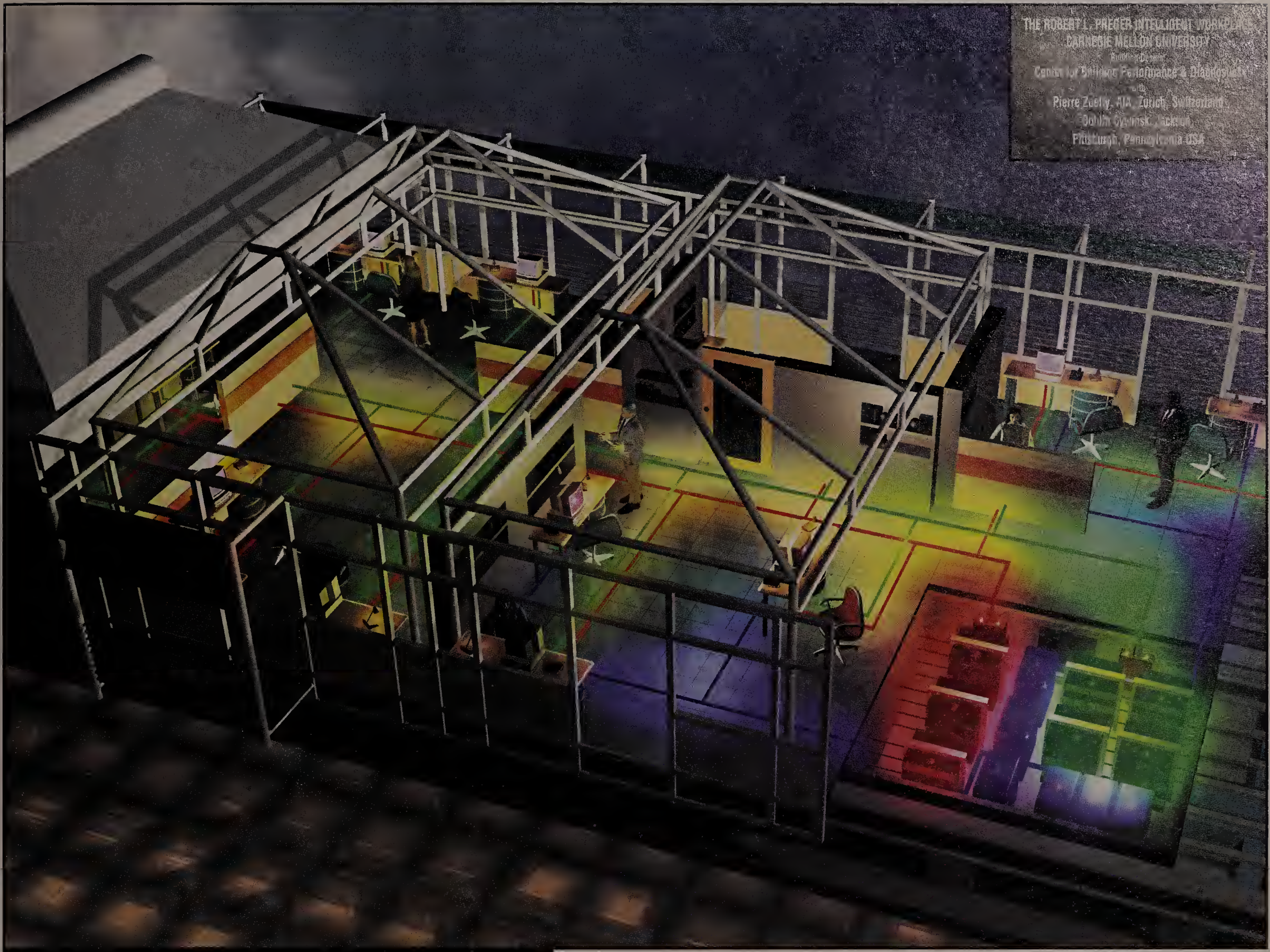
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Keeping Up with Network Technologies and Standards

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Can Novell, Inc.'s REMOTE NetWare Loadable Module (NLM) be configured to work simultaneously on SPX and asynchronous connections?

Via the Internet

Theoretically, you can configure REMOTE.NLM to use SPX and serial asynchronous connections by loading the RSPX and RS232 NLMs. The latter module requires use of the AIO and AIOCOMX NLMsm, as well. That said, there are several good reasons not to use this type of configuration.

First, serial ports (COM1 and COM2) are assigned low-number interrupts. This can slow the server when responding to local user requests because lower number interrupts have a higher priority on CPU access time than higher numbered interrupts (i.e. IRQ 11).

Second, and of greater concern, is the continual background drain on resources that occurs once the RS232.NLM has been used in a dial-up connection. To successfully use the RS232.NLM, you really need to use a modem operating at speeds of 14.4K or 28.8Kbit/sec. If you use a slower speed modem, it will take several minutes to paint the server screen on the dial-up PC.

Once a read-only program has been installed to the root of the SYS: volume on a NetWare 3.12 server, is it possible to delete this program and all the subdirectories it contains without getting a prompt reminding the user each file is read-only?

Via the Internet

As far as I know, Filer does not provide such an option. However, you can get around the problem by using the Flag command and a batch file that you flag with an N, for normal NetWare attributes.

Repeat the flagging process in each of the directories that the program has created. Then, use the Deltree command (which should be on your PC) or Filer to delete the files and directories you want purged.

Fitting together pieces for multiservice LANs

By Martin Taylor

Today's LANs and internetworks provide only a single service to the desktop: best effort delivery of datagrams. This service, enhanced by higher wire speeds and new switching technologies, has done an excellent job of meeting evolving desktop needs for business applications. But a far better delivery system is required for an emerging class of applications: real-time interpersonal communications.

According to industry consensus, desktop videoconferencing, collaborative voice and data applications and pure voice telephony will not run well over network infrastructures that provide only best effort datagram delivery. Something more is needed that can guarantee low-delay delivery of real-time streams — be it video, voice or a datastream supporting application sharing or a whiteboard conference. Quality of service (QoS) provides the answer.

With QoS, for example, an application can negotiate with the network for a particular stream averaging "x" kilobits per second to be delivered end to end with no more than "y" milliseconds of delay.

ATM popularized the concept of QoS, but it is not exclusive to ATM. The Internet Engineering Task Force is developing enhancements to the IP family, including the Resource Reservation Protocol (RSVP), to support QoS over IP-based internetworks. The IEEE 802 committee is looking at possible enhancements to Ethernet, such as packet prioritization, to support QoS in switched LANs.

The dominance of IP and Ethernet at the desktop means most new interpersonal communications applications will be IP-based and use RSVP to request QoS. At the same time, ATM will continue to offer the most cost-effective solution for scalable bandwidth with the ability to guarantee QoS in the LAN backbone. So the search for an efficient solution for mapping RSVP requests to ATM virtual circuits that deliver QoS guarantees is of primary importance for both the industry and its customers.

QoS is by no means the only requirement for supporting real-time interpersonal communications. With QoS in the LAN, audio and videostreams can be delivered to the desktop, and the LAN itself can be used to switch these streams. But also needed is interoperability with the existing voice and video infrastructures: public switched networks, PBXs and videoconferencing systems.

Hop on board

Solving the interoperability problem means dealing with the data and control planes. In the data plane, 64K and Nx64K bit/sec voice and video bitstreams need to be translated into IP packets or ATM cells, preserving the isochronous nature of these streams all the way to the desktop. This requires new kinds of circuit-switching gateways that feature LAN interfaces and telephony trunk connections to public networks and PBXs.

In the control plane, the signaling protocols used in phone networks and PBXs need to be translated to connection setup actions in the multiservice LAN. A client/server software architecture is the answer here, with the server providing PBX-like call-control intelligence for voice and video calls.

With such a system in place, the multiservice LAN supports the transport and control of real-time audio and videostreams alongside data to the desktop, and connectivity of these streams to all the relevant legacy systems and networks. With standard protocols for both transport and control, any server or endstation attached to the multiservice LAN can potentially access or process audiostreams and videostreams, or control their switching.

The implications are profound. When voice telephony is just another kind of LAN application, the PC becomes the telephone, and the LAN — together with its call-control server — becomes the PBX. The result will be radically enhanced functionality at substantially lower cost.

Telephony peripherals such as voice mail systems, interactive voice response and call loggers will be implemented as software running in standard PC servers, taking advantage of commodity-priced processing power and storage. Voice applications such as automated call distribution will move from proprietary circuit-switching platforms to open server-based software implementations.

The multiservice LAN can transport and switch wideband channels as well as voice connections, so all these voice capabilities can be applied equally to video calls. And the multiservice LAN even supports interaction between videoconferencing stations and phones — very useful if you want to bring into a conference a party who doesn't have video access, or allow an assistant to use a phone to pick up an unanswered video call.

WHAT A MULTISERVICE LAN ARCHITECTURE WOULD ALLOW

- The ability to reserve network resources for critical data applications
- Support for new kinds of interactive real-time multimedia applications
- The opportunity to integrate telephony with the data network

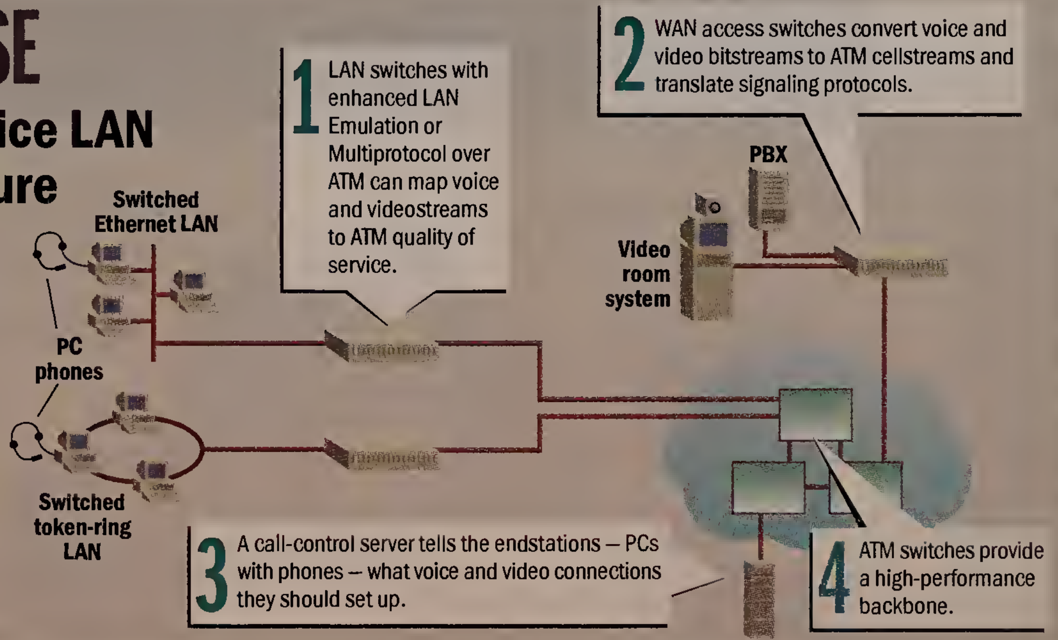
For many enterprise managers, the idea of client/server telephony challenging the PBX may seem like an impossible dream. But remember the ridicule of those who suggested in the early '80s PCs would challenge the mainframe. All the pieces are around for the emergence of the next LAN-based revolution: Pentium Pro delivers the required multimedia processing power at the desktop; ATM supports QoS; voice and video standards such as H.323 are in place; and pioneering vendors are providing the answers for connectivity and control. The multiservice LAN is almost here.

Taylor is vice president of network architecture at Madge Networks, Inc., a provider of end-to-end switched network solutions in San Jose, Calif. He can be reached by phone at (408) 955-0700 or via the Internet at mtaylor@madge.com.

UP CLOSE

Multiservice LAN architecture

A typical multiservice network would be capable of delivering a range of voice, data and video services — each designed to meet the needs of a particular application — to a user's desktop.



1 LAN switches with enhanced LAN Emulation or Multiprotocol over ATM can map voice and videostreams to ATM quality of service.

2 WAN access switches convert voice and video bitstreams to ATM cellstreams and translate signaling protocols.

3 A call-control server tells the endstations – PCs with phones – what voice and video connections they should set up.

4 ATM switches provide a high-performance backbone.

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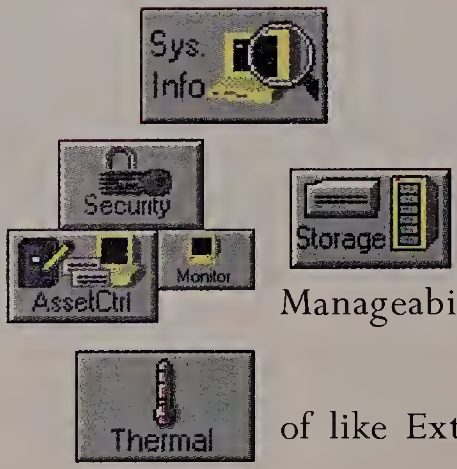

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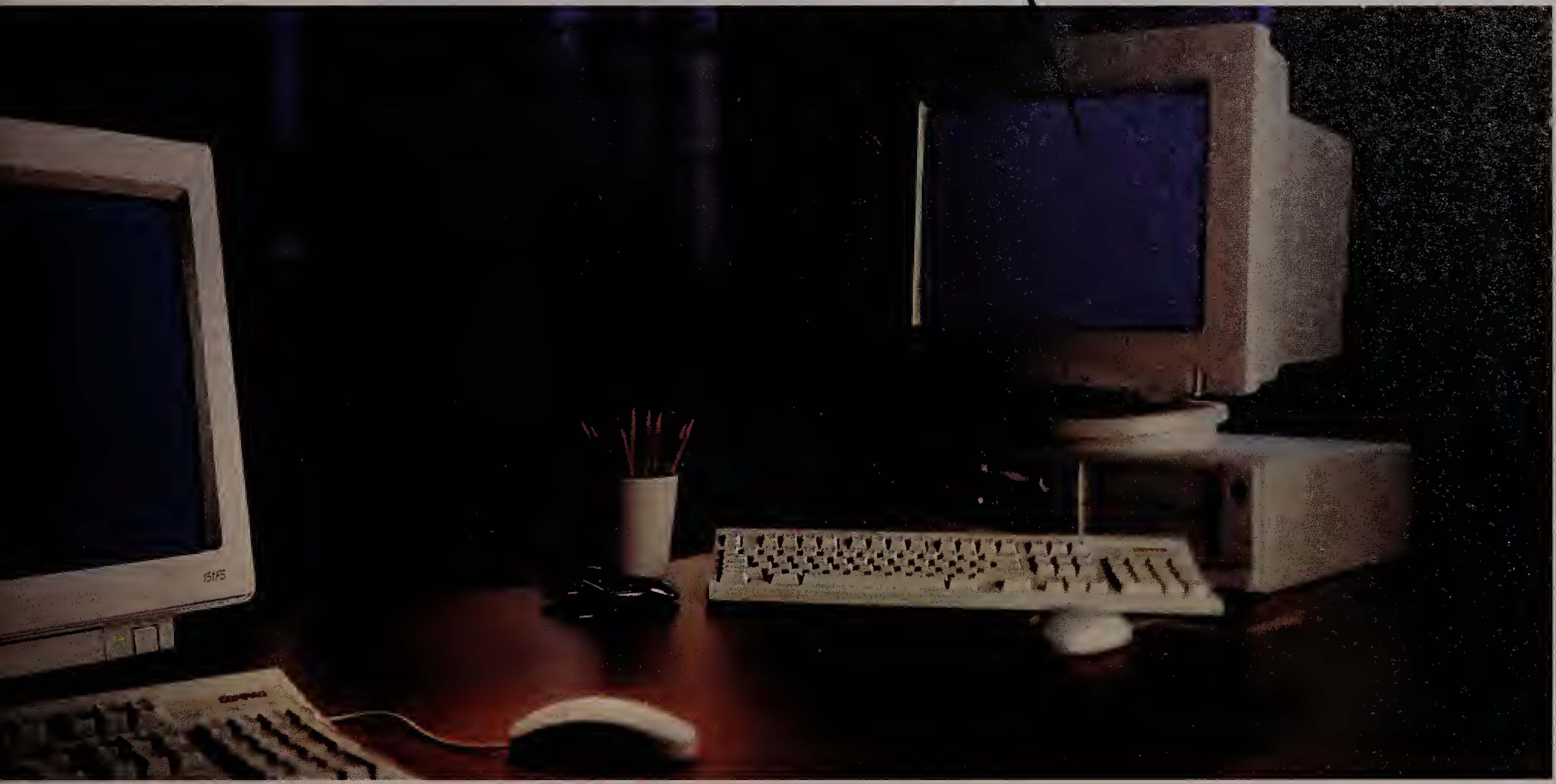

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EDITORIAL INSIGHTS

The LEC junkies

If, amid all the recent talk about telecom reform, you got the impression that the local loop was poised to become a hotbed of competition, you can disabuse yourself of the notion. It ain't gonna happen any time soon.

The reason: the local exchange carriers' (LEC) maddening insistence on stymieing competition through regulatory and legal means. Simply put, the LECs are addicted to the drug of legal wrangling — a drug that can give them temporary escape from the cold realities of the marketplace but, like all narcotics, will ultimately leave them weak and vulnerable.

The LECs got their latest fix when they convinced the U.S. Court of Appeals to delay implementation of new FCC rules defining how competitors can use the local exchange networks. And you have to give the LECs some credit for how they pulled it off. (Like other addicts, they can be pretty creative in getting what they need to survive.)

This time, the LECs claim the feds are engaged in an unlawful confiscation of their property because the FCC wants to base interconnection rates on the LECs' current operating costs, rather than figuring in what it cost to build these networks. Figuring in the investment costs would raise rates and slow competition.

What's interesting here is that you — not the monopolistic LECs — own these networks because you paid the costs of building them, along with a guaranteed rate of profit for the LECs' shareholders and managers. The FCC, logically enough, wants you to benefit as much as possible from the networks you built. That means other companies should be able to use the networks at a reasonable rate to bring you new services and lower prices.

This suit, which could take months to resolve, sprang up from just one FCC order mandated by the 1996 telecom reform law. Expect further suits and further delays when the agency rules on universal service, access rates and other sticky issues.

The FCC has asked the Supreme Court to overturn the stay on its interconnection rules, and the high court should do that immediately. In doing so, the justices could get telecom reform back on track and force the LECs to go cold turkey into competition. That kind of tough love would be for their own good.

John Gallant, editor in chief jgallant@nww.com

Teletoons

By Phil Frank and Joe Troise
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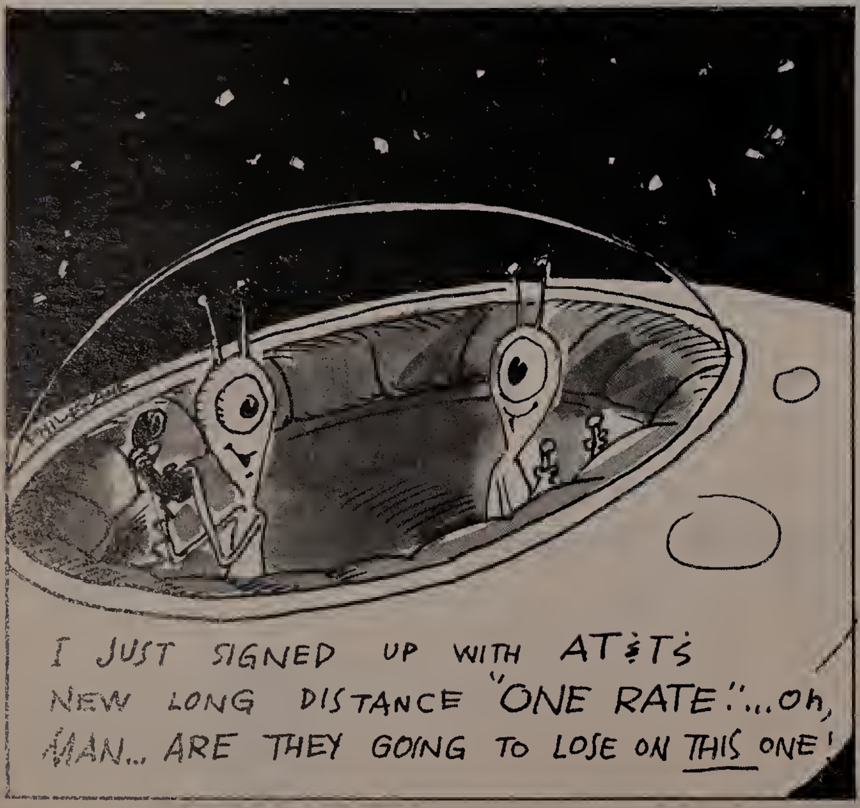

I JUST SIGNED UP WITH AT&T'S NEW LONG DISTANCE "ONE RATE."...Oh, MAN... ARE THEY GOING TO LOSE ON THIS ONE!

SPEAKING THE LANGUAGE

Thin clients offer fat payoffs, but only for limited applications

Linda Musthaler

Thin clients — barebones PCs that are also known as network computers, light clients, information appliances and Internet PCs — have many network managers salivating at their low purchase and maintenance costs. After years of buying more powerful and complex PCs (and seeing their administration and support costs rise accordingly), net managers are ready for desktop devices that are simpler and less powerful, but utilitarian just the same.

As you might guess from the number of names it goes by, the thin client has many manifestations. There are even two distinct groups that are touting similar, yet different, specifications for this network-centric computing device.

Last May, Apple Computer, Inc., IBM, Netscape Communications Corp., Oracle Corp. and Sun Microsystems, Inc. announced the specification for the Network Computer (NC). The NC Reference Profile 1 covers general hardware guidelines, Internet protocols, E-mail protocols, Web standards, multimedia formats and security features. The profile also embraces World-Wide Web standards, such as HTML, HTTP and the Java Application Environment.

In a different camp are Intel Corp. and Microsoft Corp., which just announced the NetPC standard. Relative to the NC, NetPC will offer more local processing power, expandability and an accelerated graphics port for better graphics. A key element of the NetPC thin client is a simplified version of Windows 95, dubbed Pegasus, with built-in browser capabilities. Most major PC makers intend to support this standard, including Toshiba Corp., Compaq Computer Corp., Hewlett-Packard Co. and Gateway 2000, Inc.

Despite the hoopla surrounding their low cost and superior manageability, thin clients aren't for everyone. There are a few reasons why it might be wise to look before you leap.

In addition to the NC and NetPC camps, there are other vendors that consider the thin client to be a closer cousin to a dumb terminal than to a PC. For example, Wyse Technology, Inc. has an $800 thin client, dubbed the Winterm, that connects users to applications located on a Citrix Systems, Inc. WinFrame server. Users can run Windows-based applications from the server as if they were loaded on a local disk. However, all vital resources reside on the server, not on the desktops.

With virtually no configuration required on the desktop, the graphical user interface-based Winterm workstations offer the utmost in ease of installation, while requiring minimal support. Like dumb terminals, however, if the network is down, so are the Winterm stations.

IBM's perspective on the thin client is especially interesting, considering Big Blue is credited with creating the PC revolution. In addition to throwing its support to the NC camp, IBM has a $600-range Application-Centric Terminal positioned as a PC replacement for access to applications that reside on an IBM Application System/400, 390 mainframe or other host computer. The target market is clearly business users, not consumers. IBM executives believe that many of their customers view a fully configured PC as overkill and will buy this stripped-down model instead of a full-blown PC for use as a smart terminal.

In contrast to IBM's terminal strategy, Compaq is betting users will find a terminal is not powerful enough and will instead opt to buy Compaq's version of NetPC. Compaq's device, rumored to be ready for announcement in late 1996 or early 1997, should sit well with both the corporate and consumer markets, as it will be equipped for home and office use.

Despite the hoopla surrounding their low cost and superior manageability, thin clients aren't for everyone. There are a few reasons why it might be wise to look before you leap.

First, at many companies, the infrastructure still needs improvement for a network-centric environment. Some may need more bandwidth to support the increase in traffic of both data and application files.

Second, we all need more stability in Internet development tools, and more extensive deployment of objects, applets and agents. Thin clients, particularly the NC, rely heavily on Java and related technologies that are still evolving at the speed of light.

And third, I would hesitate to buy a stripped-down version of anything. You never know what new killer application or Internet innovation lies around the corner that will require the full capabilities of a traditional PC.

Nevertheless, thin clients definitely have a purpose in life, although applications may be limited or vertical in scope.

For example, retail stores may use them for point-of-sale applications. Public information kiosks may use them to provide limited types of information. Consumers may use them at home to browse the Internet or conduct at-home banking or shopping.

If you decide to go with thin clients, use them only where appropriate. Look for specific vertical applications where users perform limited functions. And be watchful of your company's investment in Internet/intranet technology, as this is key to making applications come alive on the network PC.

Thin clients can save you a bundle on both initial costs and ongoing maintenance and support. Just be sure you don't force every user onto a stripped-down PC if you still have people or applications that require the real thing.

Musthaler is vice president of research at Currid & Co., a Houston-based technology consulting firm. She can be reached at (713) 789-5995 or via the Internet at linda@currid.com.

VENTURE OVER THE HORIZON

Resist the siren call of Internet telephony

Kevin Fong

Lately, there has been a lot of discussion in the world of start-ups about using the Internet for voice communication. It would be easy to dismiss Internet telephony as something trendy to consider in a commodity world.

However, as corporate communications managers you need to understand the business implications of voice over the Internet, and not just be enticed by the promises.

Network planners have long believed in the economically appealing one-network theory. Because all information — voice, data, video and image — is essentially digital, and because managers already have a large investment in network infrastructure, why not put as much digital data on the network as possible?

Unfortunately, reality is more complex than that. The integrated voice and data systems that were supposed to take over office communications in the 1980s went nowhere. While voice over packet-switched networks was technically possible, it wasn't economically feasible.

Internet telephony uses the 'Net to transmit voice the same way it transmits data — by treating voice as just another datastream. Most of the early publicity has been about voice compression software, from companies such as VocalTec, Inc., Intel Corp. and Lucent Technologies, Inc., that turns a personal computer into an Internet telephone. This approach is attractive because the user already has the hardware and the connection to the ubiquitous Internet. It seems to make economic sense to take advantage of those cheap 'Net bits rather than buy a phone and phone service.

Workgroup collaboration is being touted as the killer application that would benefit from the ability to send voice and data together over the Internet. However, I don't believe interactive joint work on documents is common enough to create a broad market for Internet telephony. People work on projects together, but only minimally, in real time.

Another benefit proponents of Internet telephony cite is one of pure economics. With advanced voice compression and the low cost of the Internet, why not put an Internet trunk onto a PBX and use the Internet as your long-distance carrier?

The major obstacle to this notion of an Internet PBX is voice quality. Maybe I'm a snob, but I find that cellular telephones have barely acceptable voice quality. The quality of Internet telephony is just not acceptable; because voice is compressed, it lacks the clarity and intimacy of a phone.

There's also the problem of delays. IP networks, which include LANs and the Internet, introduce variable time delays such as those experienced with satellite telephone calls. Delays are inherent in IP network design and get worse as traffic gets heavier.

With the advent of cordless and cellular phones, people have begun to accept the trade-off of voice quality for benefits such as mobility. But Internet telephony's dubious economic benefits do not outweigh its poor voice quality.

For example, proponents claim Internet telephony will cost less than existing phone service. But using some rough calculations, I figure that subscribers to America Online pay about 10 cents a minute — the same rate Sprint's dime lady is offering, albeit during off-peak hours.

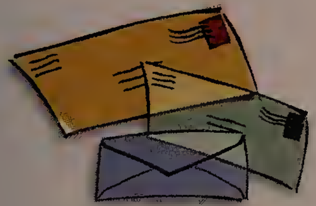
I also believe that Internet service providers, who are now charging $20 a month for unlimited access, are going to have to change the way they charge or go broke. ISPs will have to charge for usage — including time online — just like long-distance carriers do. So where is the cost savings?

Still, given the growing interest in the Internet, I've started to see a few companies that want to use Ethernet and the Internet as the basis for PBXs, based on the ubiquity of IP networking within both the local and wide areas.

But considering the problems still inherent in Internet telephony, you needn't worry about throwing out your PBXs and long-distance carriers. Given the questionable quality and uncertain economic benefits, Internet telephony is probably a siren's song you would do well to resist.

Fong is a general partner of Mayfield Fund, a venture capital firm based in Menlo Park, Calif. He can be reached via the Internet at kfong@mayfield.com.

MESSAGE



QUEUE

Let's make a deal

An open letter to John Gallant, who, as CEO of Arcdetriomphe Systems, Inc., is searching for a strategic parter to acquire his Arcnet switch producing firm ("Take me, I'm yours," Oct. 21, page 46):

John, I think we should go as a pair. You'll need software to run on those ARC_ASICs, and I have designed ARCflow (tm). Just what all those ARC_Hubs have been clamoring — or was that chattering? — for.

Obviously, you know the value of being able to see that persistent flow of RPL packets — or better yet, print server packets. We don't want those things creating disturbed flows around the network.

I do, however, have to disagree with your asking price of $300 million. Just think of all the obvious, if yet virtual, benefits our users might enjoy. All those with fully depreciated networks will gain another write-off.

So I suggest the old VisiCalc trick: Triple your number, and we won't last a month.

Looking for a windfall...

Mark Semans
Naperville, Ill.

ADSL advocates

It comes as no surprise that browsers can't make much use of Asymmetric Digital Subscriber Line's (ADSL) speed ("6M bit/sec ADSL just a pipe dream," Oct. 7, page 1). I don't even see a significant difference in the speed of loading a typical Web page through a 14.4K bit/sec modem or from a file (saved as "source," not cached — and this is Netscape Navigator Version 2.01).

Not to worry, though. "If you build it, they will come" — if we have ADSL lines, we will have applications filling them up. It's always been that way with highways, and it will be so with infoways.

Eric Bear Albrecht
President
Presto Computers, Inc.
Taos, N.M.

Of course, expecting Web access to take advantage of 6M bit/sec is just a dream. There's a world of difference, however, between the download speeds I get from my 28.8K bit/sec dial-in at home and my work Ethernet.

I also like the idea of multiple services (simultaneous voice and digital service) available with ADSL and its point-to-point dedicated bandwidth and privacy.

Would the phone companies and others like to feed us video and audio services through ADSL? You bet! So to complain that Web access can't take advantage of 6M bit/sec is to see only part of the picture for ADSL.

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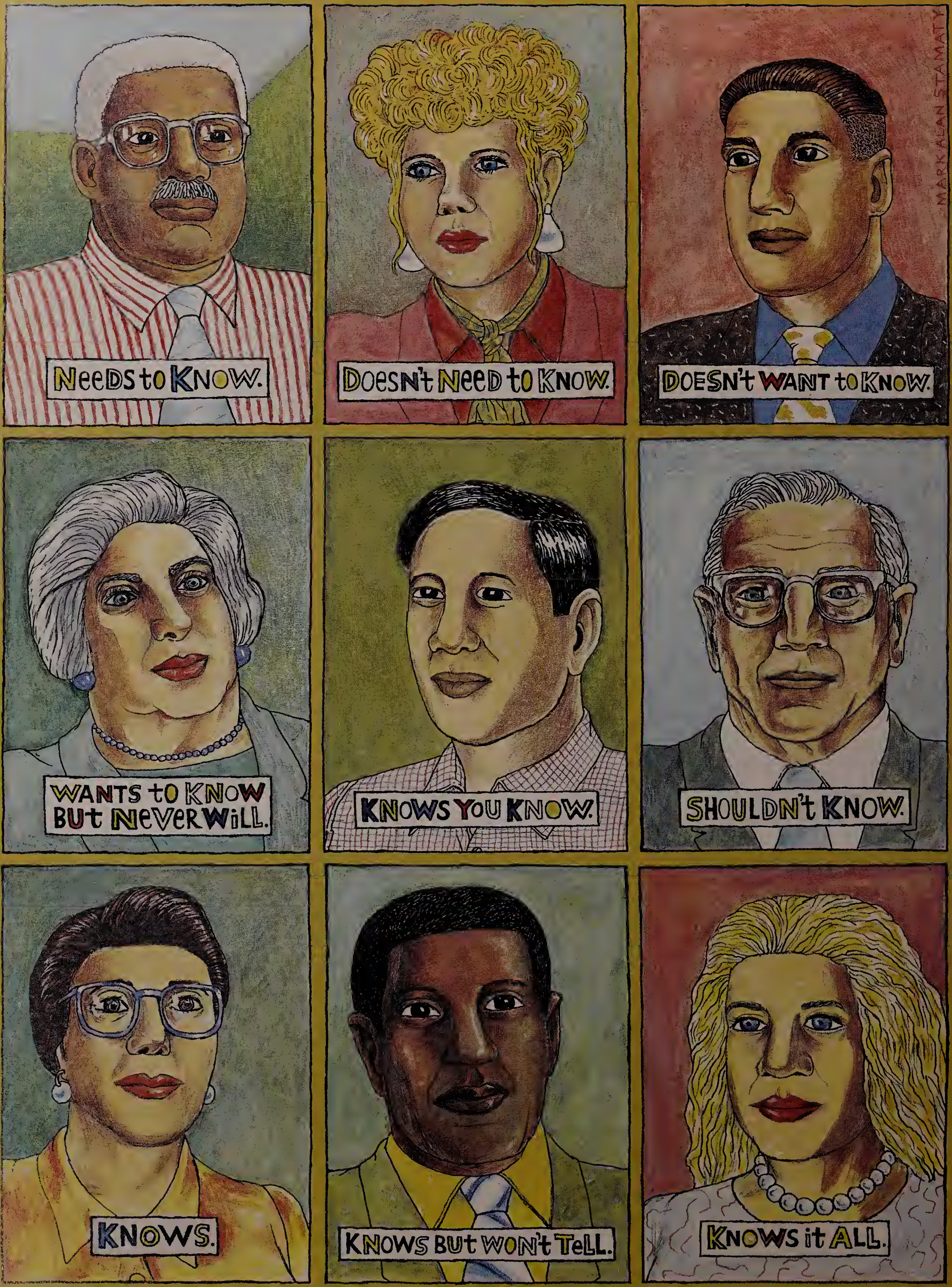
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Expert tips on keeping your site free of congestion.

Building Web sites that can take a hit

By Daniel P. Dern

"If you hit anything hard enough,
it will fall over." – **Fudd's Law,** from a Firesign Theater comedy album

Fudd could well have been describing what can happen to a Web site that isn't prepared for the worst – meaning too much success. Inundated with requests, it gags and chokes and, for all intents and purposes, falls over. Not the kind of condition conducive to supporting critical, perhaps revenue-generating applications.

If your Web site is essential to your business, it has to be able to take a lot of punishment without slowing up, never mind falling down. And given how fast many sites are growing – monthly growth rates of two to 10 times (in terms of number of hits) are common, while some are reporting growth spurts of 100 times in three to six months – nothing out of the ordinary has to "go wrong" for a site to be pushed too hard.

The good news is that Webmasters are learning more tricks and techniques to keep their sites up. There are queues you can tune, parameters to check, simple and inexpensive upgrades to be made. There are also products, such as Cisco Systems, Inc.'s LocalDirector and IBM's Net Dispatcher (previously known as ShockAbsorber), that can help you share increasingly large, complex loads among multiple machines.

"We were able to prune out nearly 90% of [operating system processes] as unnecessary to Web serving," says Viacom's Steve Plastrik. "This gave us back a lot of processing power."

BILL MILNE

Tuning and pruning

Before throwing money at problems, be sure you're getting the most out of the systems you already have in place by properly tuning them for duty as Web servers.

"Make sure the size of the Listen Queue is set to at least 128," advises Robert Andrews, Webmaster/director at Netscape Communications Corp. The Listen Queue determines how many connection requests a machine's operating system will hold until the Web server program is ready to handle them; when the queue is full, subsequent connection requests are rejected.

According to Andrews, this parameter's default configuration in most operating systems tends to be low. The ability of many browsers to request several concurrent connections to a single server, such as for page text and embedded graphics, exacerbates the problem. "Fixing this alone can improve performance from a half million hits per day to two to three million," Andrews says.

Steve Plastrik, vice president of technical operations for interactive services at Viacom, Inc., says there are typically lots of server operating system programs that you can eliminate because they aren't relevant to the tasks a Web server needs to perform. For example, he says a Silicon Graphics, Inc. (SGI) WebForce server arrived at Viacom with nearly 200 processes configured to run, most of them tasks used in generic Unix multiuser systems. "We were able to prune out nearly 90% of these [tasks] as unnecessary to Web serving. This gave us back a lot of processing power."

Strategic upgrades

No matter how much you retune your systems, it's a good bet that whatever you start out with won't suffice for long before you have to bite the bullet and upgrade your systems. Before you pull out your cyberwallet, identify the best places to spend.

"One important fact most people don't realize is that, in most cases, the limiting factor isn't the CPU power," observes Dane Atkinson, CEO at SenseNet, a New York-based Web development and software engineering firm.

"In one case, we had five servers which each had 10M-bit network cards, but when we plugged in another server, which had a 100M-bit card, it was able to stream more than the original five systems combined. So the limit was the network card, not the CPU power."

In another case, Atkinson recalls, "we were using a Sun SPARC10, with 32M bytes of RAM, and it had run out of capacity – but when we upgraded it to 128M bytes, it ran fine again, avoiding the need to buy an entire additional machine."

On the same theme, Andrew McRae, engineering manager at The Internet Co. in Cambridge, Mass., points out, "People tend to think about through-

Rules of thumb for preventing Web server burnout

■ A watched pot may not boil, but an unwatched Web site may burn. "These systems are still complex mechanisms. To stay aware of service conditions and catch problems, you have to pay attention to lots of low-level details," says Jonathan Rosenberg, executive vice president of technology at CNET, Inc. "We have programs that monitor everything our servers do. We also track down almost every user complaint we get."

Over at The Monster Board, an online career help site, observation at one point showed the site running out of disk space, according to Eric Rose, software engineer at Net Daemons Associates in Woburn, Mass., a company that has done Web programming development for the site. "Because sites like Monster Board let users add data, it's important to watch over things more carefully. When disk space gets scarce, it causes havoc for a long time."

■ "Plan expecting growth," CNET's Rosenberg says. "We designed for tremendous success, in the sense of building things we believe will scale for two or three orders of magnitude of growth. That was a lesson we learned early on."

■ "Start by overbuilding," advises Michael Silton, president of The Virtual Corporation in Chelmsford, Mass. "Compared to the cost of expert time to do ongoing performance analyses and troubleshooting, and to experiment with performance tuning, it will probably be cheaper – and yield better performance – to overbuild by a factor of 50% or more. This helps ensure that your site not only always performs well for customers, but also presents well for prospects and maintains your reputation in terms of having a good-performing Web site."

■ Use lots of small servers, such as Pentium-, Alpha- and SPARC-class systems, rather than a single big machine. "Having lots of small computers will be more cost-effective and flexible than a smaller number of large systems," Rosenberg notes.

■ "The engineering of the back-end network, inside our site, is far more important than the pipe to the Internet," reports Steve Plastrik, vice president of technical operations for interactive services at Viacom, Inc. "We have two T-1 lines and will be upgrading to two T-3 lines, provisioned at 9M bit/sec each, which isn't necessarily a lot of bandwidth, but we're using a Cisco switched Ethernet Catalyst 5000 internally."

■ Redesign your site regularly. For example, The Monster Board has gone through six versions during its two years, each representing a mix of significant updates and changes to the Web site architecture, interface, technology, hardware and software. The newest version incorporates an Oracle Corp. database in the back end and Verity, Inc.'s search engine.

■ "For helper applications invoked by CGI calls, use programs written in compilable language such as C or C++," says Rob Raisch, chief scientist at The Internet Co. With interpretive languages such as PERL or TCL, the script must be compiled and run each time it is called, which degrades performance.

Similarly, Raisch says, "Rather than use CGI calls, which have to be routed via the operating system, consider rewriting your HTTP server to include complex operations as internal functions. Some professional HTTP servers allow you to use dynamically loadable libraries, so you don't have to touch the core code."

-Daniel Dern

BILL MILNE

put but not about the number of connections, or about the CPU but not the disk. But it turns out, for example, that having a fast disk is usually more important than having a faster CPU."

And if your users have slow modems, "they'll need to be connected to you for a long time to get large files, no matter how fast your server is," McRae notes. This again points to the need to support a large number of connections.

> *"There's no ISP with reliable enough service for me to stake the business on," CNET's Jonathan Rosenberg says.*

New operating systems and server programs are making a difference, however.

"We've seen an order of magnitude in improvement in software server performance in the past few months, thanks to the move to 'threads' — multiple lightweight processes within a process — in the OS and the actual Netscape 2.0 server code," observes Netscape's Andrews, referring to operating systems such as Unix and Windows NT. Changes like these should spell big relief — and major savings or cost avoidance — for most Web sites.

Power in the right places

Good Web site creators have learned to design their pages for efficient downloading and "show the user enough quickly" sequencing.

Similarly, Webmasters are learning that the assignments of server programs and hardware must be well architected — and that the obvious decisions aren't always the right ones.

"What one often considers to be the high-load applications are often not where most of the traffic is," SenseNet's Atkinson reports.

He recalls a RealAudio broadcast SenseNet did of a concert with Deborah Harry and Joan Jett. "We'd configured most of the hardware to be RealAudio servers," he says. "[But] we had tens of thousands of users getting to the Web server handling our main page, and the load got so high that pages weren't getting served." The simple fix was to switch some RealAudio servers back to serving the main page.

Redundancy rules

As the online publisher CNET, Inc. has learned, your Web site's availability to Internet users is only as good as its link to the Internet.

So, it makes sense for major Web sites to have more than one such link, ideally from more than one Internet service provider.

"Back when we had two providers, we realized that was a good thing to do, and as we've grown, we've increased the number of ISPs we use," says Jonathan Rosenberg, executive vice president of technology at CNET.

"Four seems like a lot of providers, but frankly, there's no one with reliable enough service for me to stake the business on. Multiple providers means that if one suffers an outage, our traffic simply reroutes through the other ones."

New products, such as a yet-unnamed one from Packeteer, Inc. of Campbell, Calif., will help manage bandwidth allocation for requests — such as from Internet users to Web sites — based on factors such as connection speed, application type and IP address.

The product is due to be announced in early December.

Just as sites like CNET provision redundancy, so do major Web hosting sites such as BBN Planet, which provides both Internet connectivity and Web hosting services.

To ensure high performance and reliability, BBN employs redundancy at many levels. "The Web servers connect to an FDDI ring, which, in turn, has redundant T-3 connections to the Internet," says Larry Thompson, service line manager for BBN Planet's Web Advantage Hosting service.

With Web farms in both Massachusetts and California, BBN Planet offers its customers the option of having their sites mirrored at both locations for added reliability.

Since site mirroring can cost a significant amount of money, not all companies spring for this option. The *Los Angeles Times* was among the many companies that decided against site mirroring. Its Web site was thus unavailable for at least six hours in early October when a power

NetworkWorld Fusion
http://www.nwfusion.com

You can find more info about the products mentioned in this story on Network World Fusion. We've established links to vendor's sites for the products below.

- **OSU DECthreads httpd for VMS, a Web server for VMS developed by David Jones of Ohio State University**

The following are all variations on the same theme: products that help balance the load among multiple Web or Internet servers.

- **LocalDirector from Cisco**
  Phone: (408) 526-4000
- **ShockAbsorber, now known as Net Dispatcher, from IBM's Watson Research Labs' AlphaWorks division**
  Phone: (800) 426-3333
- **HydraWEB from HydraWEB Technologies**
  Phone: (212) 809 5900
- **Web Server Director from Rad Network Devices**
  Phone: (714) 436-9700 (Costa Mesa, Calif.) or (201) 512-9771 (Mahwah, N.J.)

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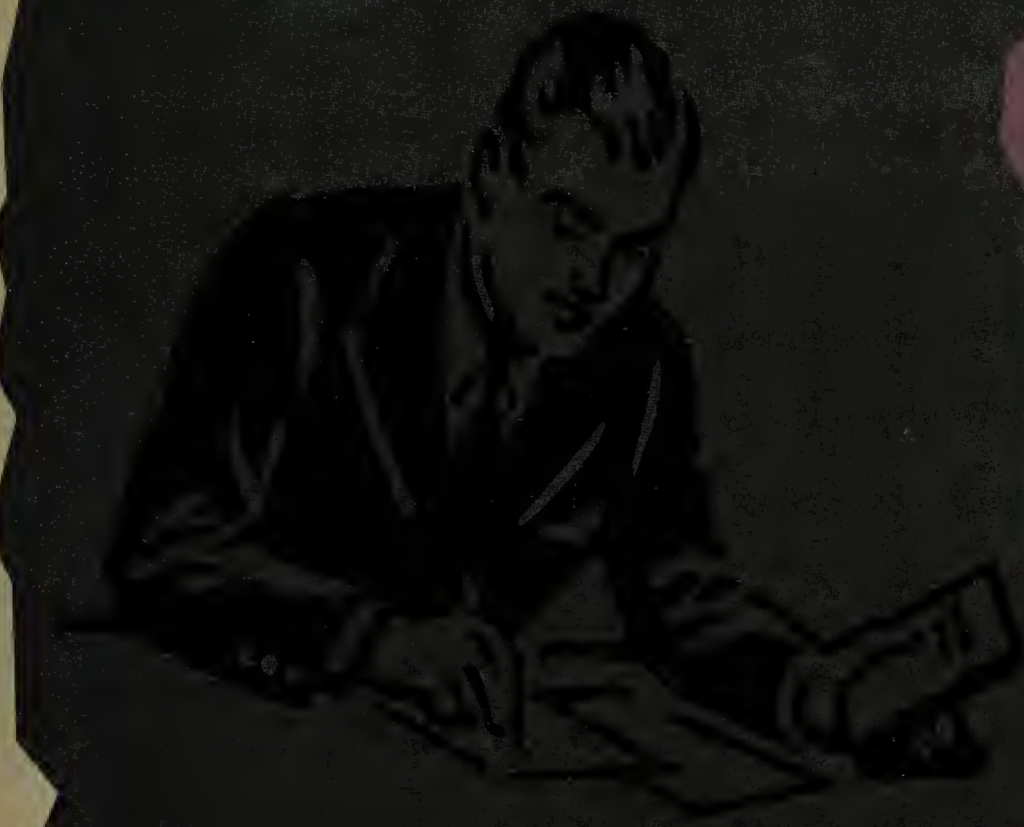

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outage at Stanford University caused BBN's West Coast Web farm to go down after the battery backup power supply was exhausted (*NW*, Oct. 21, page 1).

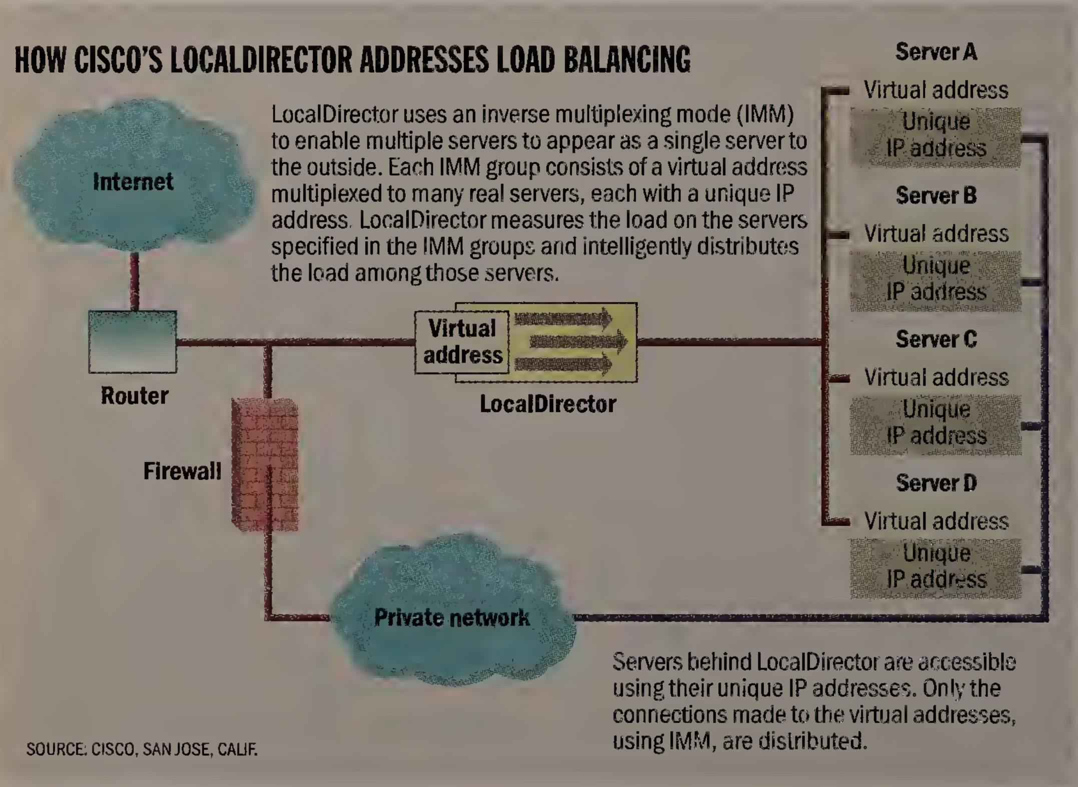
Sharing the load

Sooner or later, the demand on your server may exceed its capacity, no matter how much you tune or upgrade it. At that point, you'll need a way to let multiple machines share a common workload.

> *"In most cases, the limiting factor isn't the CPU power," says SenseNet's Dane Atkinson.*

Increasingly, major sites are turning to load-balancing techniques and products that distribute user requests among multiple servers and, where possible, shunt requests away from overloaded or crashed servers.

The most well-known load-distributing method on the Internet is called Round-Robin DNS. Round-Robin DNS is a feature of BIND, the TCP/IP utility used to assign sockets to each process request. As the name suggests, the feature enables you to configure a list of IP addresses so that requests are distributed sequentially by the Domain Name Service (DNS) server to the machines, or processes on the machines, represented by different numbers.



HOW CISCO'S LOCALDIRECTOR ADDRESSES LOAD BALANCING

LocalDirector uses an inverse multiplexing mode (IMM) to enable multiple servers to appear as a single server to the outside. Each IMM group consists of a virtual address multiplexed to many real servers, each with a unique IP address. LocalDirector measures the load on the servers specified in the IMM groups and intelligently distributes the load among those servers.

Servers behind LocalDirector are accessible using their unique IP addresses. Only the connections made to the virtual addresses, using IMM, are distributed.

SOURCE: CISCO, SAN JOSE, CALIF.

However, Round-Robin DNS is generally acknowledged to be an imperfect solution. It doesn't reflect that different machines may have different capacities (although this can, to a very limited degree, be approximated by using multiple aliases for more powerful machines); it can't factor in load levels; and it doesn't detect and skip those servers that have crashed

Another more effective option is clustering — using standard or custom tools to combine several machines into a cluster, all sharing a common file system. Digital Equipment Corp.'s VMS operating system, for example, includes a clustering feature. This has led many Webmasters to choose VMS, which runs on Digital Alpha and older VAXstation workstations, for their Web server platforms.

"VMS clustering offers a super-high performance, super-high reliability solution. It handles huge numbers of hits, and it doesn't go down if you've done it right," says Joel Snyder, senior partner at Opus One, a Tucson, Ariz.-based consultancy, who has conducted Web server performance tests.

Currently, Opus One is using a trio of $3,000 Alpha computers to support its internal Web servers, as well as customer sites. Because the clustering capability is part of VMS, "it just happens automatically," Snyder says. "Everything is fault-tolerant out of the box. You could do this with Unix systems but would have to write custom code to make it work."

Other vendors offer, or will soon offer, load-balancing software that helps distribute the processing burden among multiple Web servers. In addition to Net Dispatcher from IBM's Watson Research Center's AlphaWorks division and Cisco's LocalDirector, there's HydraWEB from HydraWEB Technologies and Web Server Director (WSD) from Rad Network Devices.

Some of these products, notably HydraWEB's and Cisco's, require dedicated hardware. Others, such as Net Dispatcher, will be able to run on shared servers, subject to platforms supported. The development version was done for AIX RISC System/6000s, and IBM expects to port it to "all the popular platforms." There are other differences: HydraWEB only handles HTTP requests whereas products such as LocalDirector and Net Dispatcher can handle any TCP/IP service, including File Transfer Protocol, E-mail, telnet and Gopher, and even CGI-bin, router and firewall traffic.

"A single copy of LocalDirector can make up to a thousand servers appear to share a single virtual IP address, and distributes requests taking into account the current load on each server (see graphic, this page)," says Bret Cunningham, product manager for LocalDirector. Cisco's target market for the product includes industrial-grade sites, large intranets and the "supersites," such as Netscape.

Viacom, for example, has five SGI Challenge S servers that typically handle about 100,000 hits daily. LocalDirector has allowed the servers to survive mega-happenings equivalent to nearly 70 times that load.

"During one of the Mike Tyson Pay-Per-View boxing events, we were getting 300,000 hits within the hour, including lots of two- to three-minute sessions where people were voting on who they thought was winning," Plastrik says.

Net Dispatcher, meanwhile, enables server assignments to be weighted based on process status, server load and content status. According to the FAQ file on the product at IBM's AlphaWorks Web site, "the resulting throughput is almost four times faster than the [Round-Robin] DNS approach."

During the 1996 Summer Olympics in Atlanta, one copy of Net Dispatcher was routing requests among nearly five dozen hosts in five locations around the world, linked via TransArc Corp.'s Distributed Filing System. "At peak times, we were getting 17 million hits a day, including RealAudio requests lasting an hour or more, plus JPEG images and lots of other very rich content," recalls Guerney Hunt, research staff member at IBM's Watson Research Center. "Overall, we got between 180 million and 190 million hits during those two weeks."

Letting users help

Even better than sharing the load on a Web site can be reducing it. With the advent of tools such as Java and JavaScript, one option growing in popularity is to transfer some of the load to an often underutilized resource — users' machines. Assuming a user's computer supports it, applets and other code can be downloaded from the Web site to the client machine where it will run. Results can be displayed to the user and communicated back to the site.

Netscape, for example, uses JavaScript to let users define and access personalized versions of the Netscape home page (personal.netscape.com).

"This wouldn't work without JavaScript," Netscape's Andrews says. By using JavaScript applications, an estimated 95% of the processing gets done on users' systems instead of Netscape's servers. "If we were to be handling all the CPU load for personal.netscape.com internally, we'd probably need another 100 fully loaded SGI machines," Andrews estimates. "[We'd also have] a major systems and network management headache. We certainly couldn't offer it for free if we had to run it all internally."

Improvements to come?

There are other developments on the horizon that could lead to further improvements.

Some experts say that HTTP 1.1 — the new version of HTTP used by Web browsers and servers to communicate — will improve performance, thanks to enhancements such as the one that enables multiple objects to be delivered on a page in a continuous stream.

However, the jury is still out; other experts say simulations show that feature will make relatively little difference, so long as the browser has only a modem-speed connection.

Netscape's Andrews also holds out hope for a restartable version of FTP. "In terms of reducing our load, restartable FTP will help a lot by letting many users avoid re-downloading the parts of files they've already gotten," he says.

The feature is already part of the FTP specification, but not all FTP clients and servers have implemented it. One that does is NcFTP, an improved command-line FTP client for Unix available free on the Internet.

So as you see, there's a lot you can — and should — do to "Fudd-proof" your Web site. To a large extent, preemptively continuing to add capacity may often be best, rather than trying to play catch-up. Yes, that and other changes will mean coughing up some dough. You have to decide whether you'd rather spend it now or risk outages later.

Dern is an independent author, speaker and consultant focusing on Internet/intranet benefits, strategies and concerns for businesses and end users. He can be reached at ddern@world.std.com. His Web site is at http://www.dern.com.

HOW DO THE EXPERTS FARE?

Find out more – including additional expert tips – about the inner workings of The Monster Board and the Viacom Web site on Network World Fusion.

We've also established links to the Web sites run by some of the experts quoted in this story. See for yourself how well their sites are standing up to the load.

- **SenseNet, a New York-based Web development and software engineering firm**
- **The Internet Co., a provider of Internet-based marketing, business and publishing systems**
- **BBN Planet, a full-service Internet service provider**
- **Opus One, a consultancy in Tucson, Ariz.**
- **Viacom, the media conglomerate that owns MTV, Blockbuster and Showtime, among others**
- **Net Daemons Associates, a network services and consulting company that has done work for sites such as The Monster Board**

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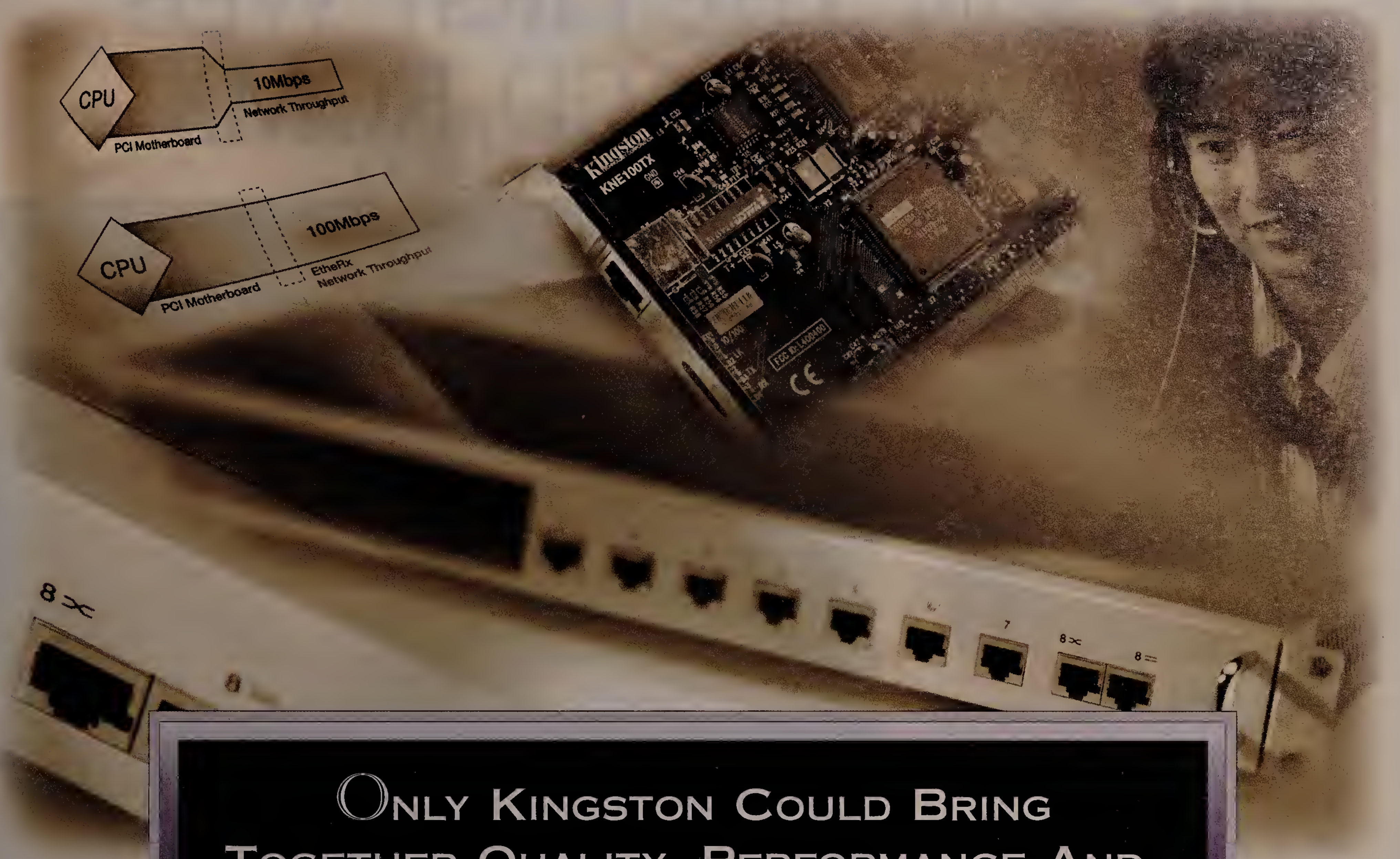

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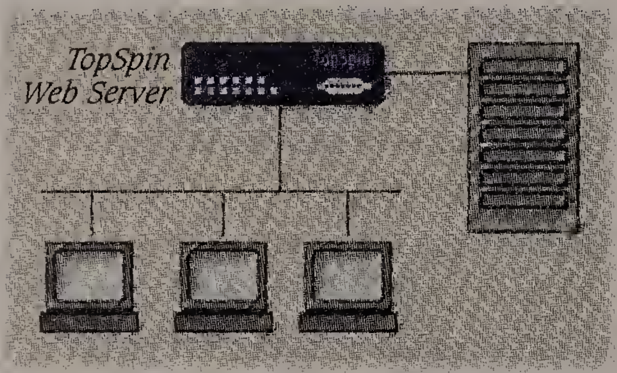

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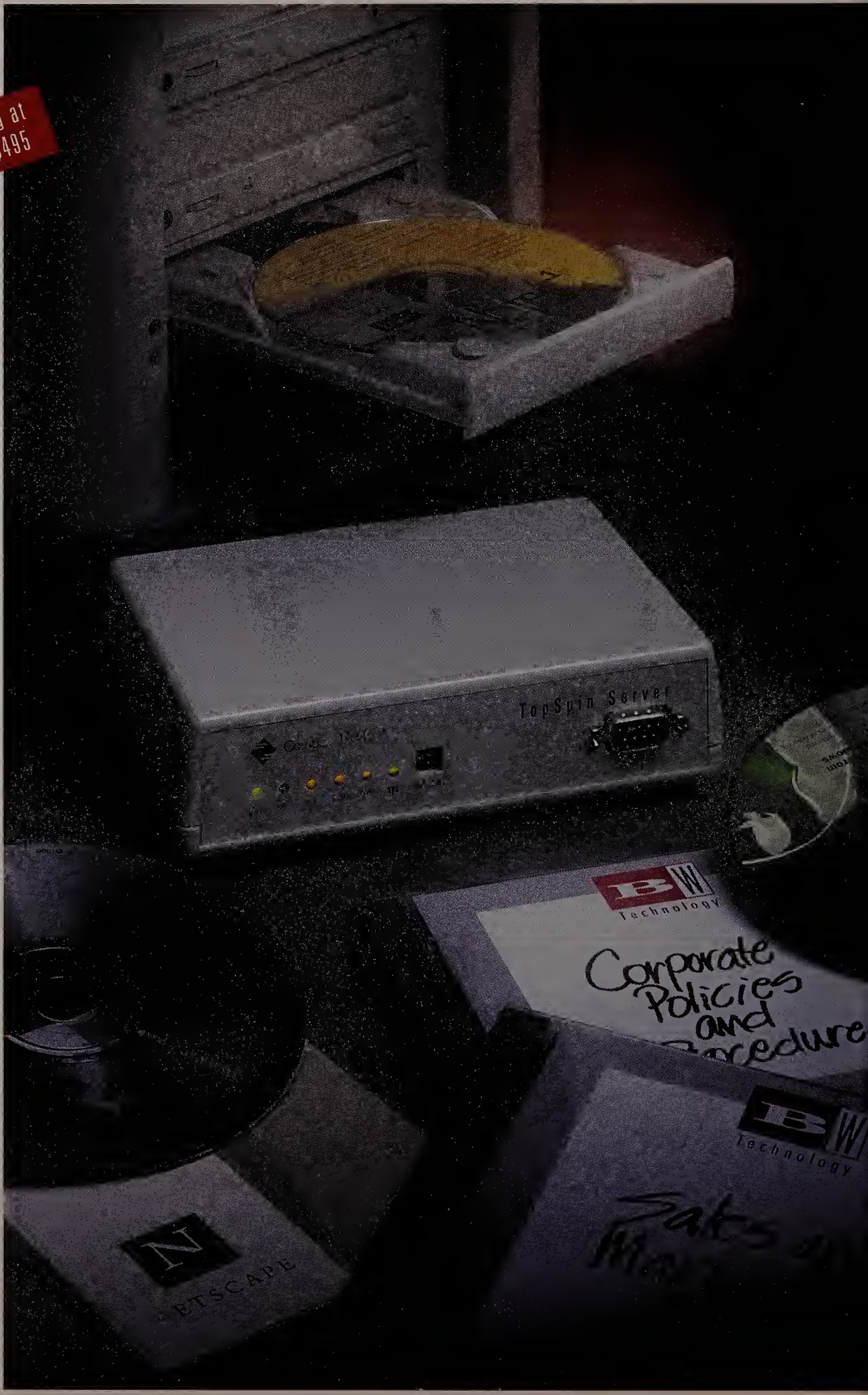

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Wedding CD-ROMs and Windows NT

Flexibility and ease of use are key factors in choosing a mate to handle multiple CD-ROM towers under Windows NT.

By Paul Ferrill

CD-ROMs and networking are a natural marriage. Windows NT Server by itself does a fairly good job as justice of the peace, serving CD-ROM drives to the network right out of the box by mapping them to drive letters. But to fully take advantage of the latest CD-ROM towers, you need third-party CD-ROM server software.

Both CDexecutive from Logicraft Information Systems, Inc. and CD Net from Meridian Data, Inc. have a simple purpose: making it easy for installations with multiple CD-ROM towers to share lots of titles.

From a user's perspective, CDexecutive does the better job of managing multiple CD-ROM titles and making them easily available. It takes away the need to know which server or specific drive a CD-ROM has been loaded into by using a virtual mapping approach tied to the title. That can make a big difference if your network has hundreds of CD-ROM drives.

The CD Net NT service takes a more simplified approach in that it just shares whatever title happens to be in the drive.

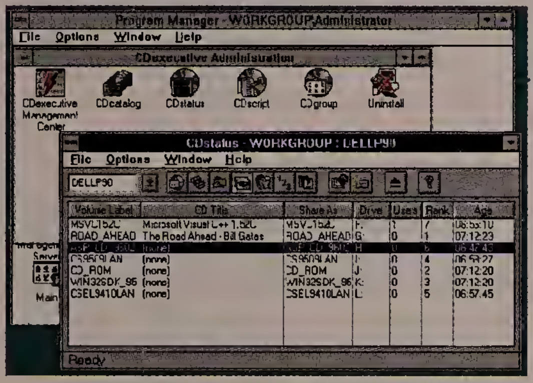
Management and administration

The products take a slightly different approach to installing a new CD-ROM. CDexecutive shares a CD-ROM title without respect to the physical volume on which it is loaded, while CD Net shares physical drives without concern to what title is loaded.

CDexecutive uses a catalogue database of available CD-ROM titles and requires an administrator to manually enter new titles into the catalogue before they can be shared with the network. To make the process a little easier, CDexecutive provides two routines — AutoScan and AutoSense — to read the volume label and serial number from a CD-ROM and generate a catalogue entry with the volume label field filled in. The administrator still has to enter the share name, access permissions, title, publisher and release date.

Once the title is in the database, you can move the CD-ROM in and out of a drive as often as you like, and the system automatically recognizes it each time.

CD Net ties CD-ROM titles to a specific physical drive. Multiple or individual CD-ROM drives are arranged by the administrator as groups and then shared collectively to the network.


Program Manager - WORKGROUP\Administrator
File Options Window Help
CDexecutive Administration
CDexecutive Management Center
CDcatalog
CDstatus
CDscript
CDgroup
Uninstall
CDstatus - WORKGROUP : DELLP90
File Options Window Help
DELLP90
Main
Ready

Volume Label	CD Title	Share As	Drive	Uses	Rank	Age
MSVC152C	Microsoft Visual C++ 1.52C	MSVC152C	F:	1	7	06:55:10
ROAD_AHEAD	The Road Ahead - Bill Gates	ROAD_AHEAD	G:	0	1	07:12:23
[illegible]	(none)	[illegible]	H:	0	6	[illegible]
CS9609LAN	(none)	CS9609LAN	I:	0	4	06:59:27
CD_ROM	(none)	CD_ROM	J:	0	2	07:12:20
WIN32SDK_96	(none)	WIN32SDK_96	K:	0	3	07:12:20
CSEL9410LAN	(none)	CSEL9410LAN	L:	0	5	06:57:45

Figure 1: *The CDexecutive status utility shows all the pertinent information about each title currently in use, including name, drive letter, share name, number of users and how long the title has been installed.*

These shares can either be automatically created at start-up or created manually by assigning specific drives to a group of users, allowing them to change titles at will. The system makes those titles immediately available without any further user intervention. You can specify the amount of time that a share can remain inactive before the user's connection is dropped.

With both products, you can restrict access for specific titles or groups of CD-ROMs to a limited group of users. This helps when there are many CD-ROM drives available over the network and the administrator wants to logically group some number of drives together, as when they are part of a multivolume product. It is also important when licensing considerations make it necessary to restrict access to a specific number of users.

CDexecutive relies heavily on Windows NT user groups to implement security and limited access constraints. Each title entered in to the catalogue is assigned a user limit and a permissions group to determine simultaneous access and security restrictions. A potential problem could arise if you were creating titles for a multidisk database and you didn't enter the same information for each one.

CD Net takes the physical approach to grouping, allowing you to link specific physical CD-ROM drives together and assign a name and access rights to the group. You can also specify the maximum number of simultaneous users for each physical group.

The last area concerns the management of actual CD-ROM devices, including determining how many users are connected to a particular title, and the loading and unloading of CD-ROMs.

In this area, CDexecutive's CDstatus application really shines. This program shows the currently mounted titles, share names, drive letter on the NT server and

ScoreCard

	CDexecutive	CD Net
Overall score	**7.7**	**6.5**
Management and administration (40%)	8	6
Flexibility and ease of use (40%)	8	7
Installation and setup (10%)	8	7
Documentation and support (10%)	5	6

Scores based on a scale of 1–10. Categories are weighted by the percentages shown.

NetResults

Product	**CDexecutive**	**CD Net**
Vendor	Logicraft Information Systems, Inc. (603) 880-0300 www.logicraft.com	Meridian Data, Inc. (408) 438-3100 www.meridian-data.com
Price as tested	$999 for 50 users (includes server)	$995 for the server, plus $795 for 25 clients
Pros	▲ Flexible virtual-drive mapping provides instant access to previously catalogued CD-ROM titles ▲ Informative and useful set of management tools for administering the catalogue of available titles and monitoring the status of CD-ROM drives	▲ Dedicated physical-drive mapping allows titles to be automatically shared without loading them into a catalogue ▲ Provision for private drive mappings for individuals or groups ▲ Supports multiple NOSes at the client
Cons	▼ Skimpy documentation ▼ No way to make titles automatically available without first entering them in the catalogue	▼ Not as flexible as the virtual drive approach ▼ Administrative tools are not as informative ▼ No support for older applications that require MSCDEX

number of users. There is also a removal rank that helps you determine which drive would be the best to eject based on usage and time in the drive as well as how long the CD has been mounted.

From the main menu, you can connect to any CDexecutive server available on the network. You can also eject the currently selected CD if the eject lock option was not set in the catalogue entry for that title. An additional button allows you to perform an immediate scan of all CD-ROM drives rather than waiting for the normal scan interval.

CD Net doesn't provide as much usage information. While you can see details such as volume name, status, member count, maximum and current number of users, CD Net does not provide any indication of how long the title has been in the drive or any kind of ranking.

Flexibility and ease of use

From a user's point of view, all that matters is: "Can I easily get to the CD-ROM I need?" The answer for both products is a qualified yes.

Both provide a mechanism for conserving drive letters. CDexecutive uses a single share point for each title, while CD Net uses a single share point for each group of titles. The CDexecutive approach of using virtual mapping makes it much easier to see exactly what you're connecting with from the Windows File Manager. You have to run the CD User program to see the same information with CD Net.

Making it easy for users to run applications is a paramount goal of these products. Both programs provide a scripting tool that makes it easy to create a file with specific instructions to run your applications. CDexecutive's CDscript application allows site administrators to generate a library of command files for running CD-ROM programs.

CDscript builds instructions from a list of options that you select in a dialogue box, including the command line to execute the program, the working directory, network details for mounting the CD-ROM and a description of the script. You can even assign an icon to identify your new application script and check out your script before publishing it on the network with a TestRun option on the menu.

HOW WE DID IT

We looked at CDexecutive Version 1.1a and CD Net for Windows NT Version 2.0. Our server was a Dell Computer Corp. Dimension XPS P90 with 32M bytes of memory running Windows NT Server 3.51 Patch Level 4. Our CD-ROM tower was a Boffin, Ltd, seven-bay unit with 6X Toshiba XM-3701B drives installed. Our client workstations included a 486/100 running Windows 95, a 486/33 running Windows for Workgroups 3.11 and a 386/20 DOS machine.

We installed both products and added CD-ROMs to the Boffin tower. We set up groups of users, and then grouped several CD-ROM titles together and made them available to a unique Windows NT group. To test the recognition capabilities of the products, we inserted and removed various titles to see how the program treated both new and previously recognized ones. We then tried to access different titles from the workstations to evaluate the client user interface.

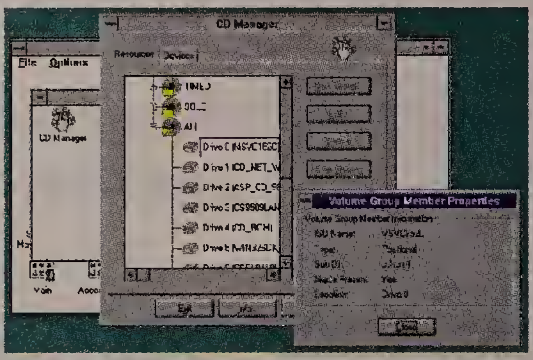


Figure 2: *The CD Manager program uses a tree-like graphic display to show the available CD-ROM titles. Double clicking on a specific drive brings up a status box.*

CD Net uses a similar method for creating scripts. The administrator version of CD User allows you to create new entries in the application database file. This file can be shared from the server or copied to local workstations.

The Edit Database dialogue provides the same level of detail as CDexecutive, including command line, working directory, mapping details, application description and icon. CD Net also provides an option to allow you to remove the drive mappings on exit, which frees up connections.

Installation and setup

The two products take slightly different approaches to installation. CDexecutive installs completely on the server side, with the service and administration software in one package. CD Net uses more of a client/server design, with the NT service software on the server and the client, and administrative software on a separate CD-ROM.

Both CDexecutive and CD Net install as NT services, meaning you control starting and stopping through the control panel's services icon. NT services are somewhat analogous to NetWare Loadable Modules in that they can be loaded and unloaded manually or automatically without rebooting the server.

The CDexecutive service periodically polls the server's SCSI adapter, looking for changes in which CD-ROMs are loaded. The polling interval is a user-adjustable value with a 10-second default. We suggest setting this value up to 180 seconds or more after the installation process is complete.

The CDexecutive service keeps up with how long a CD-ROM title has been in use and how many workstations are attached to it. It also records all activities in the Windows NT Application Event Log.

Meridian sells the CD Net server and client packages separately, but the server by itself doesn't really do much; all you get is the ability to share multiple CD-ROM drives as a single drive letter. Individual CD-ROM drives show up as folders under the single shared drive as "cd-rom1" through "cd-rom7." With just the CD Net server software installed, there is no way to identify the title you have loaded in a particular drive except the content.

One advantage of CD Net is the multiplatform capabilities of its client software, which supports both Windows NT and NetWare. Meridian also sells a CD-ROM management package for NetWare that uses the same client software, so you can connect to a CD-ROM drive on either network operating system from the same client.

Some old CD-ROM applications require the Microsoft CD-ROM extensions driver (MSCDEX) to operate properly. Neither CDexecutive nor CD Net will work if MSCDEX is loaded on the client. CDexecutive provides a small TSR that mimics the MSCDEX functionality when required by an older DOS program. Meridian doesn't have a similar feature.

Documentation and support

Neither product is long-winded in the area of documentation. The CDexecutive manual is a small, spiral-bound book with a mere 62 pages. The manual is well organized and includes ample screen shots and a complete index.

ON LINE

For links to other CD-ROM server software vendors, enter the number to the right in the DocFinder box on the home page.

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Network World Fusion

http://www.nwfusion.com

On the downside, though, there aren't many examples and the entire troubleshooting section is less than three pages. All pertinent information regarding the installation, configuration and operation of the program is covered in a concise and readable fashion. The online help matches that found in the manuals.

Meridian provides two separate perfect-bound manuals for CD Net. The Server Administrator's Guide describes in detail all the steps necessary to install the product on an NT server. It goes into much more detail than Logicraft's CDexecutive manual on NT setup specifics. For example, the guide discusses the network protocols CD Net supports and ways to configure both the server and clients for those protocols. The troubleshooting section is more that twice the length of CDexecutive's. Meridian also includes a glossary of terms.

The Client Administrator's Guide describes in detail how to configure the client software. As with the server manual, there is an expanded troubleshooting section and glossary. Both CD Net manuals include a comprehensive index and a section describing the makeup of the different INI files used by the program. The CD Net online help includes screen shots of the different applications that allow you to click on one and get a description it.

Both Logicraft and Meridian have sites on the World-Wide Web that provide access to technical support. Each has a File Transfer Protocol area for posting patches and updates to their products. Logicraft provides toll-free access to its support lines; a call to Meridian will cost you if you're not local.

Conclusions

We liked Logicraft's CDexecutive better than Meridian's CD Net primarily because of the flexibility that its virtual drive mappings provide. We also liked the automatic recognition of CD-ROMs that have been entered into the database. CDexecutive provides better administrative functionality with the CDstatus program and the logging of CD removal and insertion activity into the Windows NT event log. CDexecutive is also considerably less expensive than CD Net.

If you're running any old applications that require MSCDEX, you will want to run them on a workstation with a local CD-ROM or choose the CDexecutive product with its MSCDEX TSR stub. Most newer software titles don't care whether you have the MSCDEX driver loaded because they treat a CD-ROM drive just like any other disk drive.

If you were hoping to serve up Macintosh-format CD-ROMs with either of these products, you're out of luck.

If you spend too much time swapping disks and managing their Windows NT share points, either of these products can help.

Even a simple thing like a catalogue of available titles makes finding the one you need much easier.

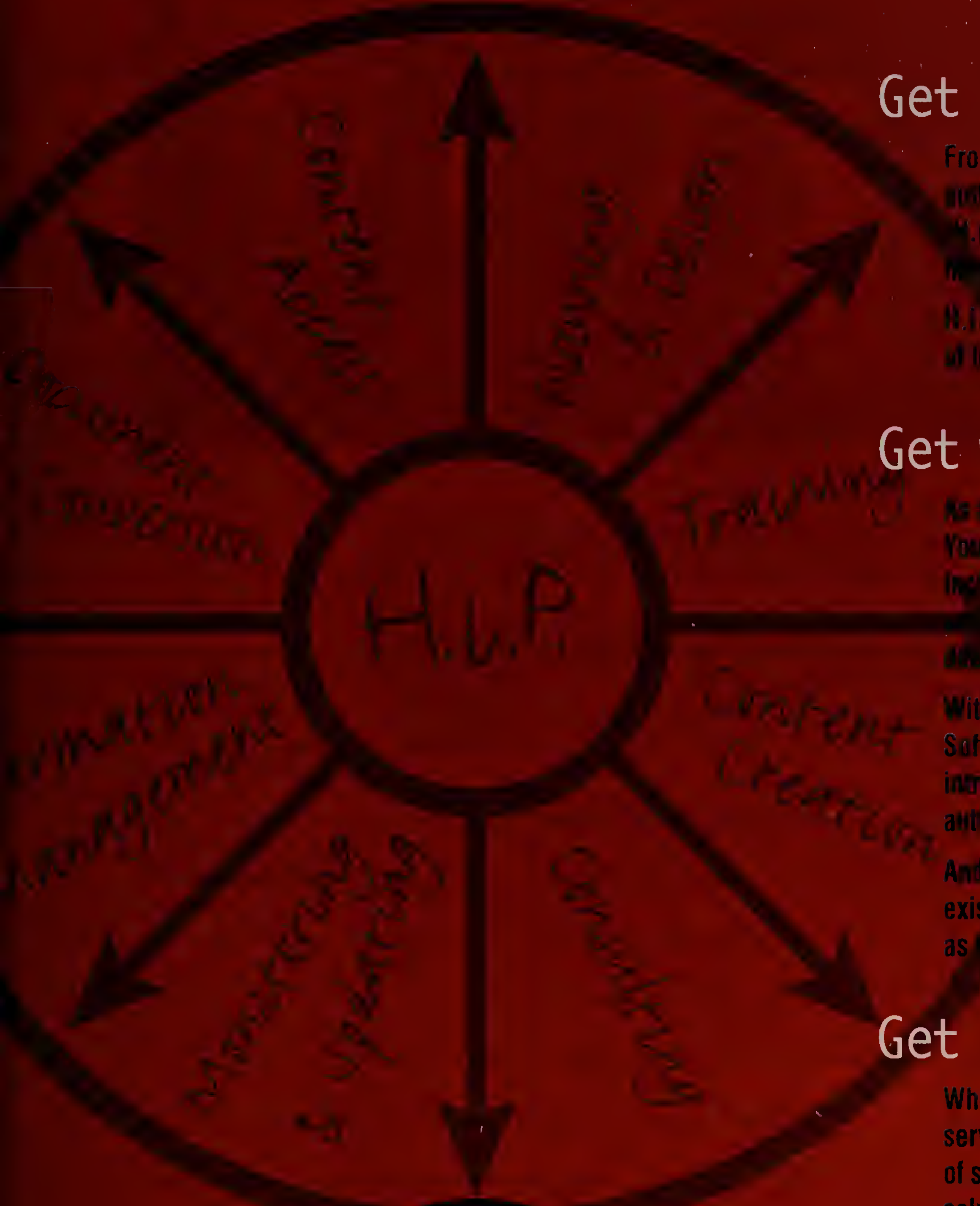
On the management side, it helps to have a program that automates the cataloguing process and tracks which titles are currently online.

The trick is to make the functionality worth the money you spend on a product that is more a convenience than a necessity. The bottom line is: If you have at least one CD-ROM tower on your network with multiple titles to juggle, you'll want to consider purchasing CDexecutive or CD Net. Either one will make your job much easier.

World TEST ALLIANCE

The alliance is a cooperative of users, consultants, educators and integrators that applies its technical and business skills to analyze and compare strategic network products. A list of alliance partners can be found on page 57.

Ferrill is an associate principal engineer at consulting firm Sverdrup Technology, where he manages several small networks. You can reach him at pferrill@fwb.gulf.net.



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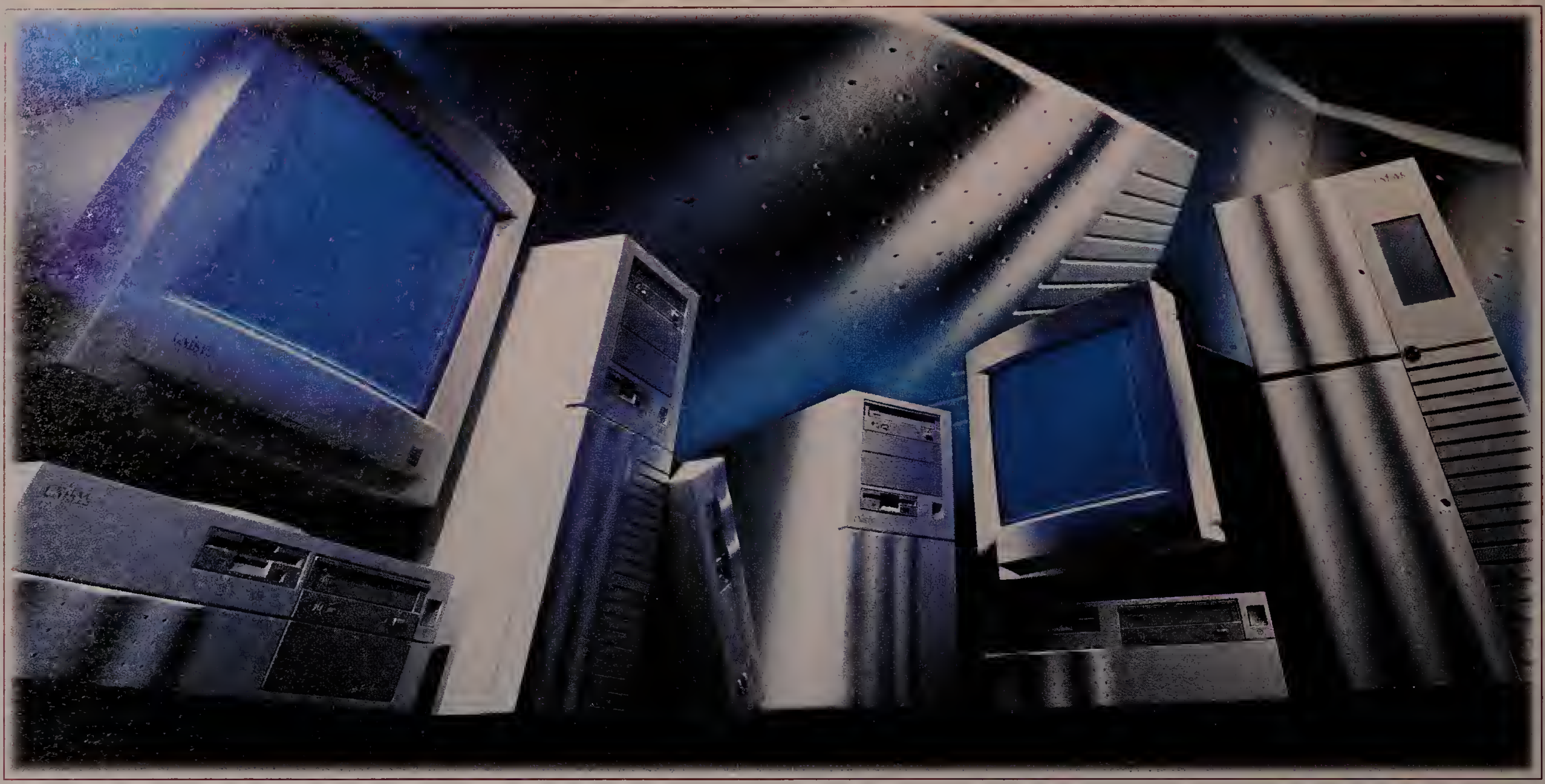

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Briefs

■ **TCS Management Group, Inc.** *will offer certification courses for call center agents, supervisors, managers and technical support specialists through its* **Call Center University (CCU)** *program, beginning in March 1997.*

The classes will be held at CCU in Nashville and in 10 other major U.S. cities. The number and length of classes will vary depending on the area of certification. Each course will cost $400 per day.

TCS: (615) 321-9358.

■ **Interpose, Inc.'s** *C/S Solution Advisor is being bundled with* **Asset Software, Inc.'s (ASI)** *Data Collection Module (DCM) to provide total cost of ownership (TCO) tools that measure, predict, manage and reduce network costs.*

ASI's DCM software collects data from each network client and provides purchasing and life cycle information based on that data. Interpose's C/S Solution Advisor software calculates cost-of-ownership benchmarks, builds migration and upgrade plans, and verifies the return on investment for planned projects.

Both software products run on Microsoft Corp. Windows 3.X and Windows 95. The bundled package costs $995 and is an add-on to the base TCO package that costs $495.

Interpose: (407) 260-5551.

■ **Mecklermedia Corp.** *is sponsoring* **Fall Internet World '96** *in New York on Dec. 9-13. There will be 150 sessions on topics that include HTML, Virtual Reality Modeling Language, Java, Common Object Request Broker Architecture, Web authoring and site management, security, Windows NT, NetWare in intranet environments, application development, distributed objects, Lightweight Directory Access Protocol and messaging directories, and security.*

Mecklermedia: (203) 341-2972.

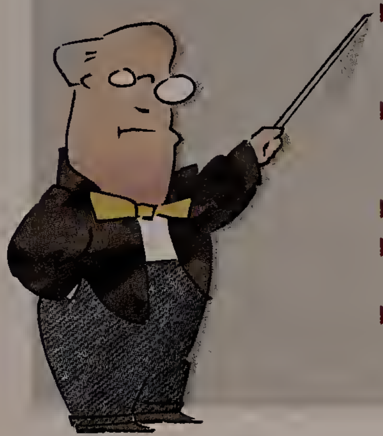
Oracle lays out architecture for 'Net-based training

By Jim Brown

Forget about computer-based training (CBT). Oracle Corp.'s Oracle Education division wants to introduce you to Internet- and intranet-based training.

WHAT OLA WILL COVER

More than 35 companies and universities are partnering with Oracle to provide Internet-based training in the following areas:



- ▶ Oracle's broad line of database management system software, report generators and application development tools
- ▶ Microsoft's Windows NT Workstation and Server products plus Windows 95 and Microsoft TCP/IP
- ▶ Novell NetWare 4.1 administration
- ▶ Lotus Notes implementation, administration and database application development
- ▶ TCP/IP networking, LAN/WAN integration and various aspects of Unix systems administration and programming

In taking wraps off its Oracle Learning Architecture (OLA) this week, the software giant is putting stock in the notion that Internet technology and object-oriented, interactive multimedia applications will become the preferred method for self-paced learning. A few key CBT vendors, such as CBT Group, Plc.'s CBT Systems and National Education Training Group, are in agreement, as they were among the 35 vendors and schools to sign up as OLA partners.

When fully fleshed out by next summer, the architecture will define standards, such as a set of APIs, that will enable course developers to build Oracle Learning Objects that get stored in an Oracle7 or Oracle8 database. Individual objects containing text, graphics, video and audio will be assembled by each student into a customized course.

Products and services supporting OLA will be rolled out in three phases over the next nine months. In the first phase, beginning in December, Oracle will offer its OLA Internet Service. In the service, clients running Netscape Communications Corp.'s Navigator, Microsoft Corp.'s Explorer or Oracle's PowerBrowser connect to an application running on an Oracle WebServer to gain access to more than 75 prestructured technical training courses.

In this first iteration of the architecture, existing CBT programs are ported to work in the initial OLA environment. These programs can be downloaded from the 'Net to run on the client machine; or students can use browsers to navigate through a series of Java applets and HTML files and take the course online.

OLA Internet Service also enables managers to access a layer of administrative software on the Oracle WebServer that enables them to set up accounts to track who is using which training programs.

Courses offered under the OLA Internet Service will cost between $50 and $500.

In Phase II — expected in early 1997 — Oracle will roll out APIs that make it possible for developers using existing CBT authoring tools to start building Oracle Learning Objects. The firm will also add learning assessment tools to the administrative layer of the OLA Internet Service software that will help managers ascertain how well students are understanding what they're being taught.

Oracle says it will fill out the architecture by next July with a stand-alone product for intranets. The product will consist of Oracle-developed OLA Authoring Tools for course development and an OLA ED-Player. The OLA ED-Player is intranet server software that uses the Common Object Request Broker Architecture and OLA APIs to enable Web browsers, set-top devices and network computers to build and run customized training courses.

For example, a student can review the content of several training programs and pick specific lessons from each to build a course. Individual lessons are stored as Oracle Learning Objects. Multiple courses can then be assembled in a customized curriculum.

Pricing for OLA Authoring Tools and the OLA ED-Player will be announced when the products are rolled out next year. ■

If you're job hunting, you can link to NetStart's CareerBuilder Web site from Network World Fusion.

FIND IT ON FUSION 1147

Type the number above in the DocFinder box on the home page.

Also, while you're on Fusion, check out the job listings in the Careers section.

Network World Fusion
http://www.nwfusion.com

Tools enable you to recruit on Web

By Jim Brown

Web-based tools that promise to help you recruit technical talent are being rolled out this week by NetStart, Inc.

The start-up firm is unveiling its client/server-based TeamBuilder product and CareerBuilder Web site. TeamBuilder software enables you to create your own Web site to post job openings, collect resumes, identify strong candidates and track the interview process. Alternatively, you can post jobs on your corporate Web site and automatically route resumes submitted to that site into TeamBuilder.

CareerBuilder gives you the option of paying a subscription fee to post 25 jobs on a NetStart-maintained Web site. NetStart collects profiles from job seekers online and will encourage candidates that claim to meet your job criteria to submit a resume directly to you.

TeamBuilder's server component comes bundled with a recruiting application and a Netscape Communications Corp. Commerce Server running under Windows NT on an Intel Corp. Pentium-based PC with 32M bytes of RAM. The client component can run under Windows 95 or Windows NT on an unlimited number of Intel 80486-based PCs.

A software wizard in TeamBuilder walks you through the process of building a job posting file and then converts that file to HTML. A resume-scoring feature enables you to flag strong candidates as you screen resumes stored in a database.

You can also build a workflow routing scheme that ships resumes to others involved in hiring.

A version of TeamBuilder due out next year will enable you to route resumes directly to existing resume-tracking applications installed in your human resources department. That follow-on release will also be able to accept resumes submitted via fax and enable you to post jobs to The Monster Board and Career Mosaic Web sites. TeamBuilder software is available now for between $4,500 and $6,000, depending on configuration.

©NetStart: (703) 709-1001.

Check out additional resources on Network World Fusion:

- ● **The list of all 75 courses available in OLA Internet Service**
- ● **A list of OLA partners**
- ● **Our report on the creation of Oracle Education**

Enter the number to the right in the DocFinder box on the home page.

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Hardware Engineering (Pittsburgh, Boxborough & San Jose)

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Development Management
Digital Design & Test
Familiarity with FPGA/Gate-Array Design
Embedded CPU Design Engineers
ASIC Development & Verification (VHDL)
LAN/WAN Product Development
ATM Interface Design Engineers
Hardware Validation & Test Engineers
CAD Designers
Power Supply Technicians
CAD Librarian
Mechanical Engineers

Manufacturing (Pittsburgh)

Manufacturing Test Engineers
Manufacturing Engineers
Senior Production Control Planners/Inventory Analysts
New Product Introduction Program Managers
Materials Planning & Control
Subcontracting Manufacturing Planners & Program Managers
Senior Buyers - Mechanical & Electrical Components
Product Managers

Software Engineering (All locations)

Development Management
ATM Signaling Development
ATM Routing Protocols
UNIX Device Driver Software and/or Kernel Development
Network Protocol Development
LAN/WAN Product Development / Testing
Network Management Software (e.g. SNMP)
Software Testing Configuration Management and /or Quality Control
Switch/Adapter Card Software and Performance Profile Testing
Windows NT and/or Novell NetWare Device Driver Software
AppleTalk Design Engineers
Embedded Systems Design Engineers
Interoperability Lab Manager

Sales, Marketing & Technical Support

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Product Manager, LAN Switching (San Jose)
Technical Support Engineers (San Jose & Pittsburgh)
System Engineers (All locations)

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- San Jose, CA - 2115 O'Nel Drive, San Jose, CA 95131. FAX (408) 441-9657. E-mail: resumeca@fore.com
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Go to the Careers section on Network World Fusion at the above address.

Four past weeks of Networking Careers can be found under Job listing.

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11/25/96	WAN. IP switching options for ATM		11/13/96
12/2/96	BUYER'S GUIDE: Tools for managing web sites. Applications. Object databases		11/20/96
12/9/96	BUYER'S GUIDE: Relational Database Management Systems	DB EXPO, New York DATABASE & CLIENT/SERVER WORLD, Chicago	11/27/96
12/16/96	LAN. Will VLANs really make managing/administering networks easier?		12/4/96

For more information or to place an advertisement, please call Pam Valentinas at 1-800-622-1108.

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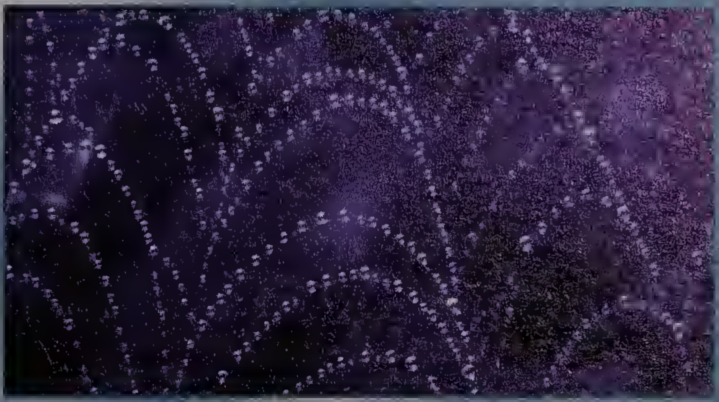

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SALES

Systems Engineer

Various U.S. locations

Provide pre- and post-sales support including product presentations, demonstrations, network designs, writing proposals and customer support. An extensive background in the design, installation, operation, maintenance and management of medium to large-scale data networks at the physical data link and network layers of the OSI model is essential. ATM expertise and thorough knowledge of networking standards, protocols and switching highly desired. **Dept. MMSE**

Enterprise Sales Representative

Various U.S. locations

Meet sales quota by successfully selling into new areas of major accounts as well as expanding business in existing areas. Gather and assimilate customer network hardware and software data, evaluate the data and recommend the appropriate products to effect solid solutions. Requires solid data communications sales experience with large corporate accounts, excellent technical translation skills and the ability to make presentations to executive level decision makers as well as technical operations personnel. Must be willing to travel locally and some overnights, based on various locations of major accounts. **Dept. NWESR**

PROFESSIONAL SERVICES

Network Engineers

Minneapolis, MN; Dallas, TX; Los Angeles, CA; New York, NY; Detroit, MI; Chicago, IL

Implement network designs and install all network and related hardware. Configure network and system software bringing network to full operation. Provide staging and integration services and configure, set-up and test new products purchased at customer locations. Load IP addresses, optimize software configuration, develop router tables, and verify that equipment meets installation specifications. BSEE or BSCS with 5+ years' hands-on industry experience and excellent knowledge of network diagnostic tools. A baseline understanding of TCP/IP, RIP, OSPF, ATM, routing, Fast Ethernet, subnet masking, IP numbering schemes, and network segmenting also essential. Must be willing to travel locally and overnights on a regular basis. **Dept. KMAM**

Network Analyst

New York, NY; Atlanta, GA; Washington, DC; Ann Arbor, MI

Provide network design, integration and optimization services to customers. Perform network audits, traffic flow analysis and optimize designs to reduce broadcast traffic. Implement complex network numbering schemes. Perform redundancy/resiliency analysis and conduct migration planning. BSEE/CS with 7+ years' experience. Strong knowledge of the OSI model with emphasis in layer 3. Requires experience in large scale network design and understanding of IP, OSPF, RIP, subnet masking, IP numbering schemes, router table designs, ATM, Frame Relay, IPX and switching. Must be willing to travel extensively both locally and overnight on a regular basis. **Dept. KMNA**

Hardware and Software Developer positions are also available for individuals with the following skills: ASIC design; VHDL; C/C++ programming; embedded systems; networking protocols; MIB; WIN32; Windows 95; Windows NT Agent software and Fast Ethernet.

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TalentQuest

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Converging! Tektronix is spearheading the technology that merges audio, data, images and video onto diverse transmission networks. Our products can be found wherever signals are stored, processed, manipulated, transmitted and received. **Our Grass Valley, California** site is located at the base of the Sierra Nevada foothills where you'll find the quality of life you desire — clean air, affordable housing, less congestion, and an excellent school system. Come join us. We currently have several opportunities available for the following talented, experienced professionals:

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- Develop software/firmware for products targeted at mid- and high-end video production systems. Products incorporate combinations of dedicated hardware and ASIC, DSP and RISC technology. Software ranges from low-level device drivers to large scale system design. Requires a BSCS or equivalent and 5+ years' software design and coding experience. Strong C/C++ and RTOS (VxWorks, QNX, PSOS) skills are imperative. A background with communications standards (TCP/IP, Serial, Winsock, etc.), embedded system design, and object-oriented analysis/design desired.

- Develop Video Codec products utilizing video compression and telecom transmission protocols in a UNIX, MS-DOS, cross-development platform environment. An MSCS or equivalent is required, along with C and Assembly programming experience in real-time systems. Must have knowledge in software design and development methodologies (MPEG-2 compression and transport stream protocol a plus), and microprocessor development tools/techniques.

- Design and implement communications protocols, analyze network designs, and implement network architecture utilizing newly emerging high-speed networking protocols. The code you will design will manage Video Conferencing Networks, interfacing to an Informix Database and Sun/Solaris operating system. Requires a BSCS or equivalent and 5-8+ years' experience with UNIX, C programming, real-time systems and asynchronous protocols.

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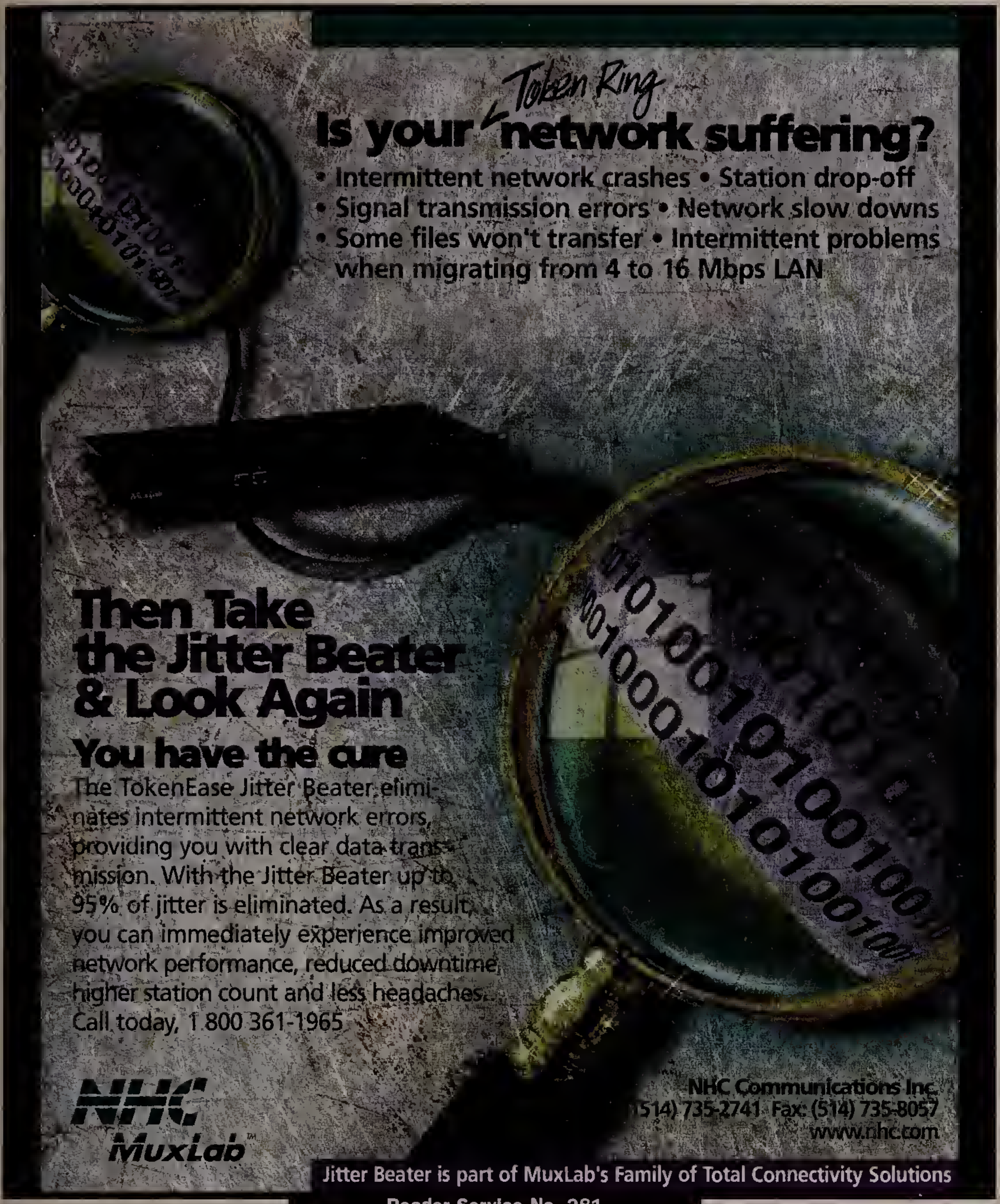

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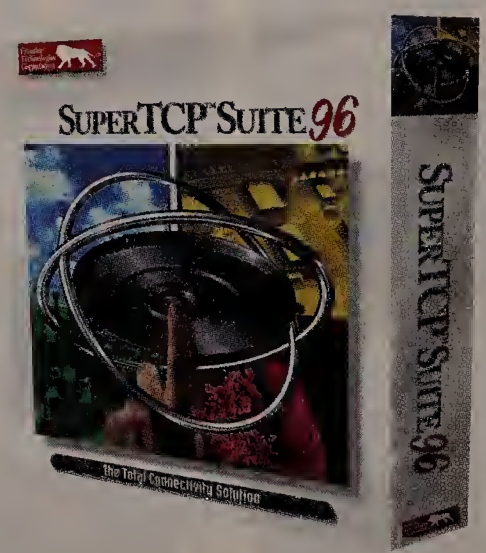

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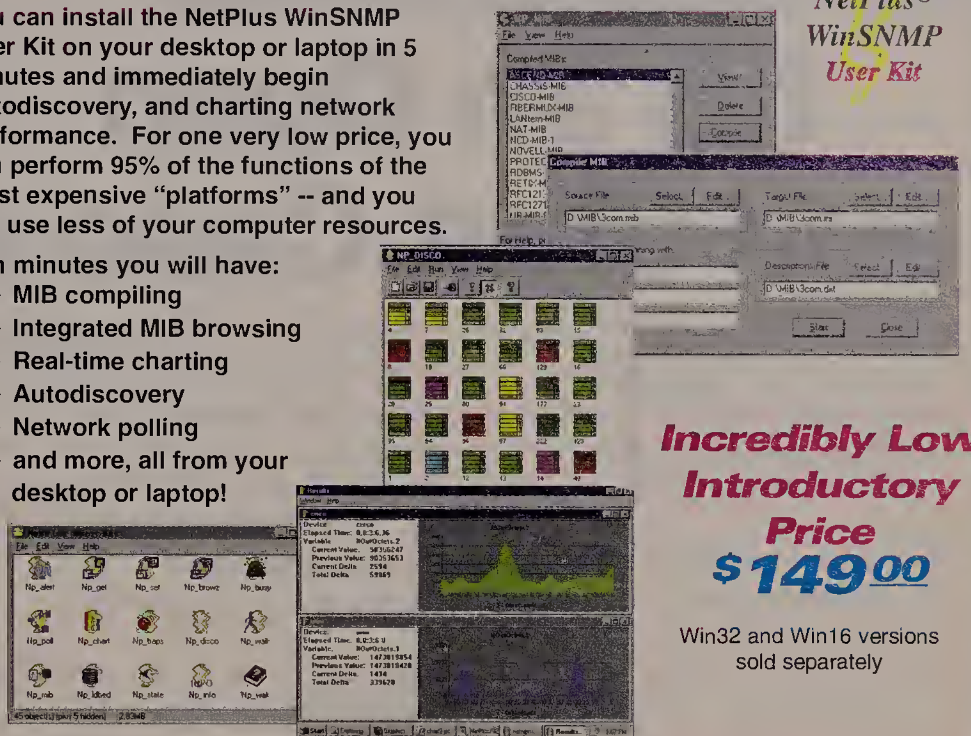

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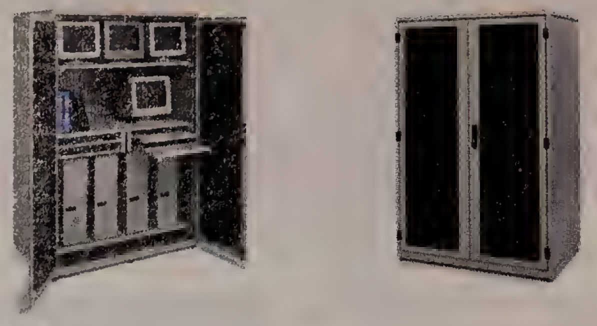

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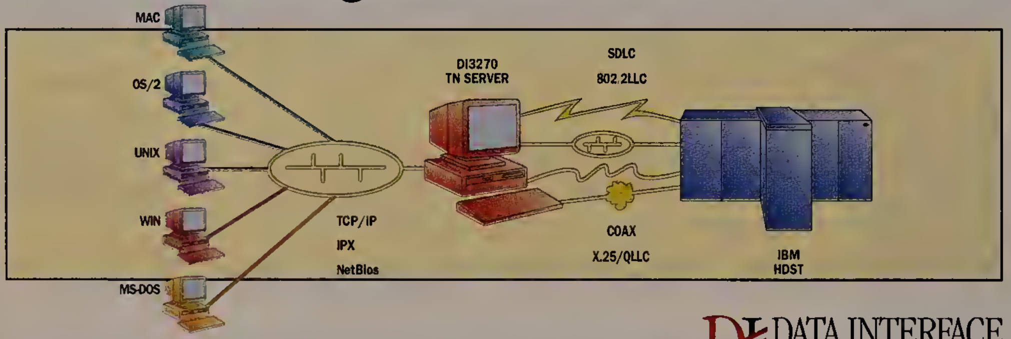

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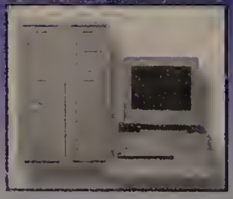

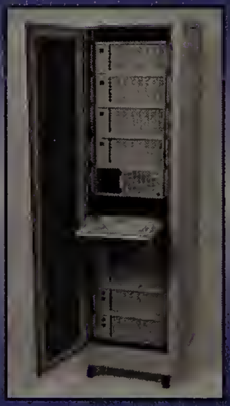

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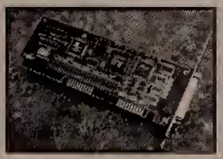

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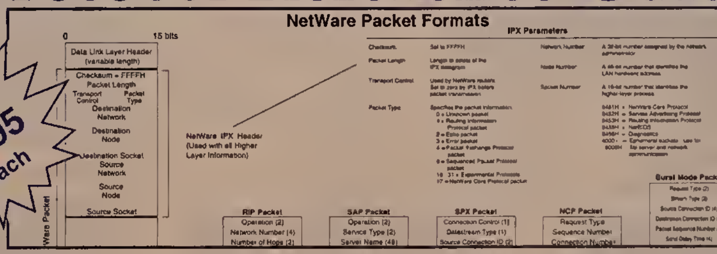

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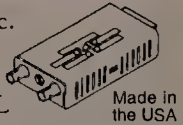

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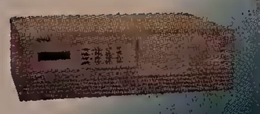

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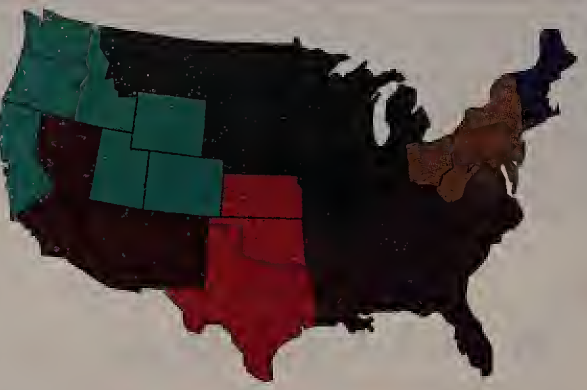

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Continued from page 1

with Intel Corp., a specification for a NetPC that would be able to run downloaded Microsoft applications locally, but would have no expansion slots (some vendors, notably Wyse Technology already offer a similar device, which works with Windows applications on an NT server).

A key part of the announcement was Microsoft's promise to deliver new operating system features, dubbed Zero Administration, that would let administrators centrally manage PCs as well as remotely distribute and install software.

Longtime Microsoft developers and users said they would probably stick with Microsoft's PC-oriented direction. But many others, even including those in the midst of upgrading to Windows NT, said the Network Computer products from Sun, IBM, Wyse Technology and others offered benefits too compelling to overlook.

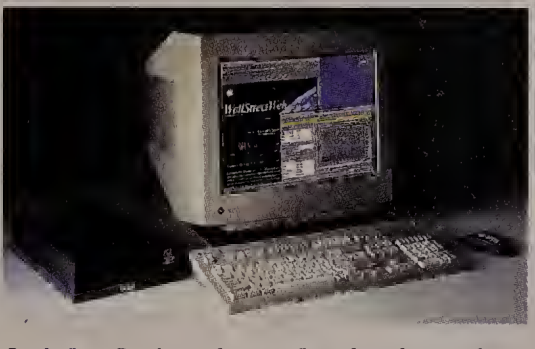
The initial attraction of the Network Computer is that it is supposed to be a lot less expensive than a PC and, more importantly, reportedly cuts the costs of upgrades, maintenance, software deployment and training (called total cost of ownership, or TCO).

"Configuring and managing desktops by the thousands is an overwhelming cost," said Mike Prince, chief information officer of Burlington Coat Factory Warehouse Corp. in Burlington, Mass. "High support costs are the real killer. That's what makes the thin client [the Network Computer] very appealing."

"Based on our testing recently, we think we can significantly lower the TCO of the desktop," said John Andrews, president of CSX Technology, the IT arm of CSX Corp. in Jacksonville, Fla.

But cost is not the only issue. CSX's beta experience with a dozen JavaStations has already caused changes in the plan to shift desktops from OS/2 to Windows NT, with its accompanying Microsoft Office applications suite. That change will go forward "but that doesn't mean our strategy [now] will embody Microsoft Office on all our desktops," Andrews said. "We're rethinking that."

That kind of rethinking flies in the face of Microsoft Chairman Bill Gates' insistence that moving to the Network Computer will mean buying costly new servers and desktops, as well as rewriting applications. For Gates, the issues raised by thin clients are mainly about administering remote PCs and distributing software. "We have not focused enough on that," Gates said.



Sun's *JavaStation, a low-cost Java-based network computer, was announced last Tuesday.*

But where Gates frames the issue as a matter of degree — making it marginally easier to administer PCs — some users see the issue in more fundamental terms. Users claim it is a matter of managing the entire user interface layer to create, as Gates has been saying for years, "information at your fingertips."

"It's not just a function of downloading and running software," Burlington's Prince said. "But you download the interface tier of a multitier computing architecture. You can centrally administer the applications and make your strategic hardware investments centrally while still providing a very functional desktop."

Sites like British telecom giant British Telecommunications plc, another JavaStation beta tester, are not waiting around for Microsoft to get this right. BT has written its own Java-based customer service application, which is the first of many. "We're not going to stop our current project to wait for what Microsoft is proposing," said Terry Carlin, BT's head of systems and service strategy.

Carlin also said Microsoft's NetPC announcement struck him as vague and self-serving.

He added that the alternative Network Computer reference specification had been developed with broad industry input, while the NetPC appeared to be a Microsoft contrivance.

Skeptical of both

There are, of course, plenty of people who believe they've got a fully functional desktop in Windows. "If the server shuts down, you're dead in the water [with the Network computer]," said Robert Van Hoose, Webmaster at Defense Activity for Non-Traditional Education Support, a Department of Defense education program in Pensacola, Fla. "I don't see investing a lot of money into diskless PCs. They tried it once before. It didn't last long. People didn't stick with it, and they won't now."

Another user agreed. "Our company wouldn't be looking at either, at least in the pharmaceutical division. We would rather have software stored locally on the machine," said a network manager at a large pharmaceutical company.

"[Sun's Network computer] doesn't run the current software," said Kent Ervin, interactive media consultant at Eastman Chemical Co. in Kingsport, Tenn.

"You want applications on your local drive; you don't want to wait for downloads," said Mike O'Shea, systems administrator with Satellite Dialysis Centers in Redwood City, Calif.

Despite its reluctant NetPC entry, Microsoft has its fans. "I'd go with the Microsoft and Intel solution," said one Visual Basic programmer. "Everything I've done, every machine I've worked on in the last 10 years, has been Microsoft and Intel."

But that is the language and mindset of legacy systems. And a growing number of MIS managers, Java, the Internet/Web and the Network computer represent a brand new operation and opportunity.

Florist FTD Corp. is only mildly interested in the Microsoft NetPC announcement because FTD is focused on integrating Java broadly across its FTD operations, according to Bill Phelan, the company's vice president of technology. FTD members use about 7,000 dumb terminals and 10,000 PCs to transmit orders across the FTD network to fill flower-delivery requests to customers in different cities.

To simplify and speed up software distribution, FTD plans to phase out PCs among its members in favor of JavaStations.

"We have a huge 3270 replacement issue," CSX's Andrews said. The company has about 10,000 terminals in the field. "We need those users to be enabled with a lot more networked intelligence than the 3270 can provide." CSX is currently testing a Java-based 3270 emulation product that lets browser users access existing host applications.

Providing that added "network intelligence" with new applications that are deployed via the Network Computer does not seem to be a problem either. BT has 4,000 programmers, most of them trained in C++. They are all being moved to Java.

The Capital Markets group at First Union Corp. in Charlotte, N.C., also has embraced Java so its programmers can much more quickly deliver new functions and features. "Instead of having to manage a global [monolithic] application, we can manage individual applets, updating them in real time," said Tom Kitrick, vice president of strategic plannings for the group's IS arm, which is beta-testing five JavaStations.

First Union has embraced object-oriented, distributed client/server computing over a TCP/IP WAN. "To extend this model, and use Java and a thin client, this is already what we're trying to do," Kitrick said. ■

Sprint

Continued from page 1

carrier officials said last week.

According to industry observers, Sprint's program is timed to respond to a flashing neon signal from AT&T that it is time to move SNA private-line users to frame relay. Two weeks ago, AT&T raised private-line prices by 3% to 10% and simultaneously lowered frame relay prices about 7%, further widening the gap in the cost of the two services in frame relay's favor (see story, page 8).

Don't discard traffic

To prepare for the SNA Advantage Program, Sprint last Friday was due to turn up a set of Burst Express Plus feature enhancements tailored to the needs of SNA users. Most notably, the carrier was set to add 16K and 32K bit/sec committed information rate (CIR) options to its lineup of permanent virtual circuits (PVC).

Sprint is keeping its existing 19.2K and 38.4K bit/sec CIR options, noted Sandra Brown, large-market portfolio manager for Sprint's Market Development Group in Dallas. But by pricing the 16K bit/sec option $10 per month below the 19.2K bit/sec option, Sprint is, in effect, lowering its prices, Brown said (see graphic). The bulk of SNA traffic runs at 9.6K or 14.4K bit/sec today, she explained, making 16K bit/sec of CIR enough to prevent the network from discarding traffic for these delay-sensitive applications.

More choices for the cautious

Beginning Nov. 1, Sprint enriched its choices of committed information rates (CIR) on frame relay permanent virtual circuits (PVC) to entice SNA users:

PVC CIR	Existing / new option	Monthly price
16K bit/sec	**New**	**$140**
19.2K bit/sec	Existing	$150
32K bit/sec	**New**	**$170**
38.4K bit/sec	Existing	$180

Additional PVCs at the same location cost less. Volume and term discounts not included.

SOURCE: SPRINT, DALLAS

Until now, Sprint has primarily sold less costly zero-CIR circuits in which every frame is marked discard-eligible, forcing users to trust their frame relay traffic entirely to the carrier's network design.

But Sprint officials expect conservative SNA users to demand that the discard-eligible bit be turned off, even though Sprint is also reducing the cost of zero-CIR circuits from $115 a month to $100 a month.

The new 16K and 32K bit/sec PVCs also match CIR bandwidth options long available from both AT&T and MCI Communications Corp. Not having the same CIR options as its rivals complicated matters for Sprint's sales force, Brown said.

As expected, Sprint also is raising its separate frame relay data delivery guarantee from 98% to 99% to match MCI's guarantee (*NW,* Oct. 7, page 6).

Serious inquiries only

Sprint officials emphasize that the SNA Advantage Program is designed to weed out frame relay tire-kickers, since users must pay for usage during the three-month parallel trial period.

But unlike most carrier deals, users have no further obligation after the first three months and do not risk any onerous termination penalties, Brown added.

Technically, SNA Advantage Program users can run traffic over Sprint's frame relay network in parallel with any carrier's private-line service.

But the program is geared toward capturing the AT&T installed base, since "AT&T has such a large share of the private line market," Brown said. ■

Cerf

Continued from page 1

We've covered a number of network outages and other Internet events over the past six months. Are these indicative of systemic problems on the 'Net or are they just isolated local issues?

Some of the problems that have occurred are very local. But to the extent there is a more systemic problem, that shows up in routing overloads — and they are serious. They are definitely problems we all collectively share. The problem is, some of the solutions require investments. While some providers are prepared to make the investments, some others are reluctant or unable, and they become weak points in the system.

As the routing tables get bigger, you have to have memory to accommodate them. If you fail to make the investment and start whacking off parts of the routing table that don't fit — which some competitors have done — it causes problems for that competitor's customers, but it also causes problems for my customers who can't get to the people they need.

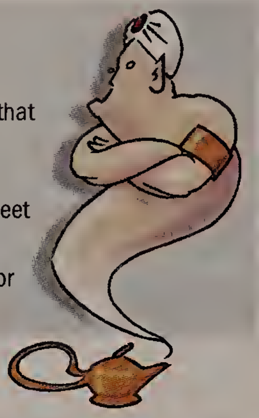
CALLING ALL GENIES

Three wishes Vinton Cerf would make to improve the Internet:

Wish 1: Tap into an unending supply of switches and routers that will continue to handle the capacity required.

Wish 2: Embed new special features into the 'Net as soon as possible, including RSVP, and multiple classes of service to meet real-time requirements.

Wish 3: Find new ways of further reducing customers' costs for gaining access to and using the Internet.



STAN BAROUH

"If you look at what people are doing today with Internet telephony from a PC or laptop, it's almost hilarious."

There's a good deal of chatter these days about flat rates on the Internet. Do you believe that model will become the norm?

It was the norm for quite a long time, yet I don't see how that works out in the long run. There are two things that strike me as difficult.

Flat rates work because you look at the demand, you look at the total cost, you look at the statistics of average use, and you average it all out. As long as customers stay statistically within the envelope, everyone is satisfied.

Guys like AOL are not simply flat-rate. They charge a flat rate up to a certain amount of usage and then they crank in big numbers.

Plus, there is a real need to deal with the fact that usage is going up, cost is therefore increasing, and the disparity is starting to make a difference.

What's your outlook for Internet service providers offering guaranteed bandwidth on an inter-ISP basis?

My guess is there will be very significant pressure during 1997 for all of us to cooperate and implement that. What will have to happen first is the router vendors will have to be able to demonstrate interoperability at that level.

Today, we can easily pass packets back and forth, but to pass traffic that includes class-of-service requirements will take some very serious interoperability work among the vendors of equipment and then among the service providers.

What's the single most important piece of advice you could offer readers today about using Internet services?

The most solid advice I can offer is: Make very sure the internal networks are properly cared for in terms of security, firewalls and the like. And make every effort to look at ways to integrate the communications requirements of the telephony and the data worlds.

We, as carriers, should also be pressed very hard by the customers to give them a single wideband connection that allows carriage of all the services, giving the customer the opportunity to dynamically allocate capacity among those services.

What should Internet users be most worried about right now?

I think security is the most important element for them to be interested in. That means paying attention to firewall technology and cryptography. But frankly, users need to look more critically at how the Internet is being used inside their company. It's truly astonishing how few people know how to configure a machine to work right. If they put machines out that are accessible to the public, they absolutely need to be configured defensively or you wind up like the CIA did — getting its home page hosed. It's wonderfully funny, but an excellent example of how some users don't understand.

Do you think we'll ever end up with two Internets: one for business users willing to pay for greater reliability and security, and another for folks just browsing Web sites?

The answer is a simultaneous yes and no. My expectation is a single Internet, but with multiple classes of service. Many of us are working very hard on trying to bring multiple classes of service into the Internet framework.

RSVP, for example, is a technique for letting the customer at the exterior define packet requirements. However, the router vendors are still in a very early stage of trying to figure how best to implement that. MCI, Intel and Cisco are in the middle of a series of RSVP trials, and one thing that has become clear is getting the idea to scale up — even on a single network — is quite a big challenge, let alone with multiple vendors.

Yes, there's a school of thought that asserts RSVP will not scale up for the Internet.

I don't think it will scale up the way it is currently contemplated.

If we can maintain a distinguishable, preferential service vs. standard service inside the core of the 'Net, and we size it correctly, then we're getting into the packet equivalent of traffic engineering. But, frankly, we are very early in Internet technology and don't have an equivalent set of rules for the Internet that the telephony world has developed over the last 100 years to do traffic engineering.

What about suggestions that the federal government needs to get involved in greater regulation of the 'Net somehow? What would you tell the government about the 'Net?

To regulate it as a business seems to me not a wise thing to attempt because no one — certainly not the FCC — has a thorough understanding of how this should all work. And I don't think we want to stifle the creativity that has flowered in the rather open Internet environment we have today.

"If you put machines [on the 'Net] that are accessible to the public, they need to be configured defensively or you wind up like the CIA did — getting its home page hosed."

How about Internet telephony? Will it ever be big?

If you look at what people are doing today, particularly Internet telephony from a PC or laptop, it's almost hilarious. It's pretty much an analogy to ham radio: You get on, you view a directory, and you see some people who are registered and try [to call] them and they don't answer.

Check out the complete transcript of our Vinton Cerf interview.

Enter the number to the right in the DocFinder box on the home page.

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Now, PC to telephone is more interesting because the other party can be reached. I would expect that type of service will turn out to be more interesting in the short term.

Looking ahead five years, how do you see the Internet being used differently from what we know today?

We will have implemented various levels of quality of service, certainly two, if not more. There will be roughly 300 million machines on the 'Net, which is about half the size of the telephone system, so it will be a formidable network.

By that time, I think we will have seen a commingling of the services that today are very distinct. Today, we think of video and radio and telephony and Internet as four very distinct things.

Five years from now, we'll see a considerable intermixing of those services, so that all of them will be serviceable through the Internet in various quantities. We should see some mutual reinforcement among the different service types; you'll find yourself in the middle of a television program and then go after Internet content associated with it either directly or indirectly. And while you are on the Internet, you'll draw in video or music or sound. ■

NetworkWorld

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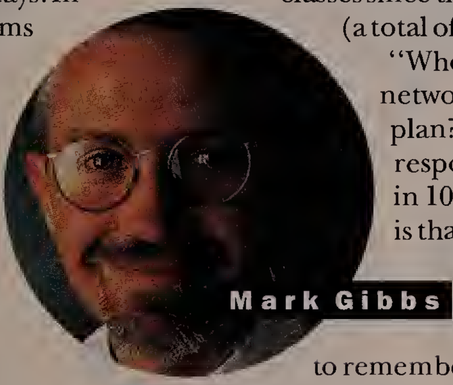
I’m not at my phone. Could it be quality or alligators?

From my answering machine: “Hi. This is Mark Gibbs. I’m either on the other line or away from my desk. Or I may have been taken hostage by Microsoft product ‘evangelists’ determined to make me a true believer that Bill is, in fact, not the Antichrist but actually the savior of modern civilization as we know it.

“Of course, I may just be screening my calls in case you are a complete bozo. Or perhaps I just couldn’t take all those calls from ‘salesthings’ trying to sell me on a chance to invest in/buy/or otherwise part with my hard-earned money for <make up your own ridiculous, only-a-complete-moron-would-want-this product or service here>.”



Really, it astounds me what passes for sales technique these days. In the computer world, it seems that selling is becoming increasingly oriented to consumers and less to professional users. Just try to get vendors to give you any information beyond product pulls and a price list.

My recent column about dead pixels on the active matrix screen of my new Fujitsu Milan sparked a flood of sympathetic responses. Actually, to be exact, they were mainly sympathetic — some were along the lines of “Only two? You’re lucky! We had <fill in a number significantly greater than two>.”

What still amazes me is that I cannot find policies on what manufacturers consider to be acceptable numbers of defects in screens in specifications, warranties or product documentation (or what passes for documentation).

The only time it seems policies on acceptable levels of defects are made public is when you call the vendor to demand a replacement. Then you find out that whatever you’ve got is OK by them. No surprises there.

Am I missing something? Since when does any vendor get away with selling an imperfect product?

Wait a minute, I must be getting old and feebleminded! Of course, what fooled me was that I was only thinking hardware.

I cannot find what manufacturers consider to be an acceptable number of defects in screens.

Software! That’s where products that are flawed and incomplete are sold as if they were of acceptable quality. (And we can hardly bring ourselves to send them back! “But I need that,” we say.)

Which leads to the topic of Quality (note that cap): It’s an elusive goal for many products and, for that matter, networks.

At the root of quality problems in networks is this: We don’t have network quality assurance plans.

I have polled every one of my seminar classes since the beginning of 1996 (a total of 26 classes).

“Who has implemented a network management plan?” I ask. I get a “yes” response from about one in 100 companies. And why is that? Because, to recycle an old joke: When you’re up to your ass in alligators, it’s hard to remember that your objective was to drain the swamp.

That’s the problem. The majority of us are so hell-bent on fixing all of the broken stuff that the idea of doing something as frivolous as, say, checking network response times or analyzing firewall logs seems totally ridiculous.

And those are just two of dozens of checks you can, and should, perform to check network quality.

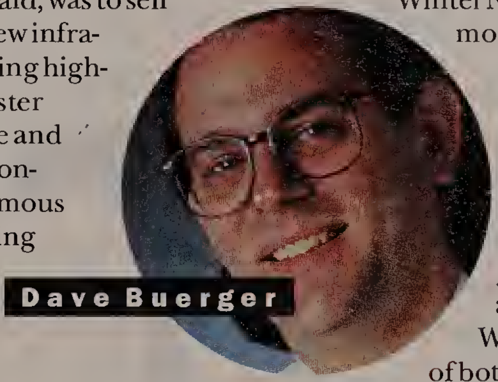
After the first few checks, you’ll have some measurements that give you a baseline.

Then, when you run your checks at regular intervals, you’ll be able to see if trouble is brewing.

“So, after the tone, leave me a message about how you assure quality (or don’t) on your network, how you fight off the alligators or what you want for Christmas.” Beep.

Leave your electronic messages at answering.machine@gibbs.com or your phone messages at (800) 622-1108, Ext. 504. Oh, and guess what? On my new Fujitsu, I still have that ol’ jumping cursor problem. Ho-hum.

The NC showdown winner is: [buzz] None of the above



Scott McNealy, Larry Ellison, Bill Gates and the other egg throwers in the Network Computer (NC) brouhaha would deny it’s a family feud. But to network managers looking in from the real world, the NC miniwar just seems silly.

Almost a year ago, I accused NC advocates of pushing a Trojan horse. Their real goal, I said, was to sell users expensive new infrastructures, including high-margin servers, faster networks, software and support services controlled by the infamous glass house. Nothing sinister there — that’s what we’d expect of vendors.

But the stakes involving the lowly NC have escalated beyond that. Vendors now want more. They want to control your soul.

Last week, McNealy’s Sun Microsystems, Inc. unveiled its heavily promoted JavaStation network computer. For about a thousand bucks, users will get a diskless computer, keyboard, mouse and 14-inch color monitor.

The stakes involving the lowly NC have escalated. Vendors want more. They want to control your soul.

JavaStation relies on software loaded from a server each time the device is used. According to proponents, NCs such as JavaStation will save lots of dough because they are easier to support than general-purpose PCs. Claims like that grab attention because the five-year total cost of owning a networked PC is about $43,000, according to Gartner Group, Inc.

McNealy and Oracle Corp.’s Ellison have been the NC’s key poster boys. Their current life mission is to convert users from Microsoft Corp.-based operating systems and applications running on PCs powered by Intel Corp. processors. Actually, that’s the polite way to describe their mission. *The New York Times* reported McNealy as saying their top priority is “to kill Microsoft.”

As for the millions of us slobs who are happily computing on (God forbid) Wintel platforms, I guess we’re supposed to say, “Forgive us, Father Scott and Father Larry, for we have sinned.”

In fact, you might think Microsoft and Intel executives are feeling some guilt, judging from a hastily convened press conference last week. They reversed their anti-NC creed and pledged allegiance to the NC concept, albeit a different NC than the one spelled out in Oracle’s NC reference specification. The Wintel NetPC essentially will be a more cost-efficient PC.

NC visionaries, be they conquistadors or knights under siege, are advocating the right thing — to a point.

Yes, Java is cool. But Java is no more a be-all and end-all solution than Windows. The scariest part of both visions is they require you to rely 100% on the network for everything.

My editor will probably chide me for saying this, but only a fool would rely 100% on the network for everything. Private network reliability has a long way to go. Even the public network has been known to hiccup. Faulty links to servers will inevitably cause work jams.

NCs look like terrific replacements for dumb terminals. But NCs such as Java-Station do not run Windows-based applications. With the year 2000 looming on the horizon, IS programmers are going to be busy enough without converting existing applications to Java.

The simultaneous processing of communications-intensive applications, such as desktop videoconferencing and telephony, could tax puny NCs. Servers are great for off-loading some jobs, but not all.

And don’t expect miracles from NCs in the cost-cutting department. Gartner Group says more than half of ownership costs stem from supporting end-user operations.

NC advocates should tone down their rhetoric and quit feuding. Network computers are a reasonable choice for the right situation.

But the religious philosophy of replacing all PCs with server-centric devices such as JavaStation just won’t fly. Microsoft and Intel don’t need a moat after all.

Errata: Last week, I identified Shiva Corp.’s Powerburst by the wrong name.

Buerger is a networking industry consultant and writer in Atlanta. He can be reached at dave@buerger.com.

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as a world-class cyclist and
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is his ability to turn
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